PTC (15-Day Pre-Permit Construction) Application

EnviroDyne Corporation, Wendell, Idaho

Prepared for

Environ FOC

March 2007

CH2MHILL

CH2MHILL TRANSMITTAL

To: Idaho Department of Environmental Quality
1410 North Hilton
Boise, ID 83706

From: Rick McCormick

Attn: Mr. Bill Roger, DEQ State Air Program Manager

Date: March 22, 2007

Re: 15-Day Permit to Construct
EnviroDyne Corporation
Wendell, Idaho

We Are Sending You:

X	Attached	Under separate cover via	
	Shop Drawings	Documents	Tracings
	Prints	Specifications	Catalogs
	Copy of letter	Other:	

Quantity	Description
1	15-Day Pre-Permit Construction Application (CD Included with modeling files and emissions est.)
	$1,000 Application Fee Included

If material received is not as listed, please notify us at once

Remarks:

Copy To:

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Contents

1.0 Introduction

On behalf of EnviroDyne Corporation (EnviroDyne) of Wendell, Idaho, CH2M HILL is requesting a Permit to Construct (PTC) for a new stationary source. This new stationary source will be an electrical power generating plant consisting of five duel-fuel compression ignition (CI) engines, associated electrical energy generating sets, appurtenances, and buildings. This new source will be constructed in Wendell, Idaho, on land currently used for agriculture. To expedite construction for this new facility, the requirements for Pre-Permit Construction approval will be followed in accordance with the *Rules for the Control of Air Pollution in Idaho* (IDAPA) 58.01.01.213.02.

An application fee of $1,000.00 has been included with the application submittal in accordance with IDAPA 58.01.01.226. A signed general information application form GI has also been included with this application package.

An informational meeting has been scheduled at the Wendell Town Hall, on March 22, 2007, from 3:00 to 4:00 p.m. This public announcement was published in the Gooding County Leader on March 15, 2007. A copy of the public announcement is included in Appendix A.

This pre-permit construction and PTC application includes a process description, plot plan, process flow diagram, emission estimates, modeling protocol and results, and regulatory review. This application is intended to satisfy the requirements for Pre-Permit Construction in accordance with IDAPA 58.01.01.213.

2.0 Process and Engine Description

The EnviroDyne plant is proposed to be constructed on generally level, agricultural land in Wendell, Idaho. This approximate 156-acre site, located at the corner of East 3400 South and South 1800 East Roads, is a rural area currently used for agriculture. The site currently contains farm buildings on the northeast corner of the property, which will be removed when the power generating plant is constructed.

The EnviroDyne plant will produce electrical energy from the combustion of natural gas and diesel fuel (that is, duel fuel) internal combustion engines. Five Fairbanks Morse dual fuel engines will be installed and will be capable of producing, in total, 12 megawatts of electrical energy. Approximately 2 megawatts of this energy will be used onsite for the operation and approximately 10 megawatts will be sold to the Idaho Power grid. The Fairbanks Morse engines are expected to be run in a base-load mode and are expected to operate at about 90 percent of load capacity at all times except for maintenance shutdown, or unexpected interruption. These engines will combust mostly natural gas, with a small percentage of pilot diesel fuel added to provide fuel ignition. Natural gas will be supplied by an underground pipeline that will be extended to the plant site. Diesel fuel will be brought to the site by bulk tank truck and stored in a 12,000-gallon tank. The plant will consist of a power generating building housing the five combustion engines, maintenance, office, and storage areas. Each engine will have a separate exhaust consisting of an exhaust duct, silencer, and 32-foot-high stack that exits out the side of the engine building. The diesel storage tank will be constructed of steel, approximately 12 feet in diameter and 13 feet high, and will have a vent for breathing losses.

The Fairbanks Morse engines will be CI engines (no spark plugs). These dual-fuel engines will burn approximately 99 percent natural gas, with 1 percent diesel pilot fuel added. The diesel fuel allows for ignition of the gas/diesel fuel mixture during the compression stroke cycle of the engine. All engines will be tuned to operate in the "Low-NOx" mode of operation to provide for lean-burn conditions that will minimize the amount of thermal NOx generated as a result of fuel combustion. There will be five Fairbanks Morse "Enviro-Design" engines that burns a mixture of 99 percent natural gas with a 1 percent pilot diesel fuel mix. There will be two –9 cylinder and three –12 cylinder engines. Fairbanks Morse engine information and specifications are included in Appendix B.

Each engine exhaust will be fitted with a carbon monoxide (CO) catalyst for the reduction of CO emissions sufficient to reduce CO emissions below the 250 ton Prevention of Significant Deterioration (PSD) major source threshold. The final vendor for these catalysts has not been selected, but a typical CO catalyst comprised of metal compounds bonded to either a metal or ceramic substrate will be used. These catalysts will be sized to achieve 65 percent removal of CO that will maintain potential emissions to approximately 222 tons per year. This conservative design assures that the source will stay below the major source threshold even under the highest potential operating conditions. CO catalyst information on a typical installation is included in Appendix C.

The Fairbanks Morse engines will operate on natural gas and diesel fuel, but will also be able to combust a bio-diesel fuel or fuel blend. EnviroDyne plans on operating these engines on the natural gas and diesel fuels while it investigates the feasibility of installing a bio-diesel fuel production system at the Wendell location in the future. The scenario being considered is to produce bio-diesel fuel from plants, in this case blue-green algae. Certain types of algae are relatively high in bio-diesel content and can be grown in very large quantities in reactors using a portion of the engine stack gases for heat, and CO_2. This type of bio-diesel production is currently in operation and can economically produce a renewable liquid fuel that has emissions at least as low as petroleum-based diesel fuel with the added benefit of reducing greenhouse gas (CO_2) and other emissions, as well as heat. Should EnviroDyne wish to install a bio-diesel production system at a later date, this installation will be permitted separately. For the purposes of this application, EnviroDyne seeks to combust only natural gas and petroleum diesel fuel in the engines. The Idaho Department of Environmental Quality (IDEQ) application forms are included in Appendix D.

3.0 Scaled Plot Plan and Process Flow Diagram

The general project location is shown in Figure 1. The project boundaries and the Wendell property are shown in Figure 2. The combined scaled Plant Layout and Process Flow Diagram is shown in Figure 3. Figures 1, 2, and 3 are provided at the end of this report.

4.0 Potential to Emit Emission Estimates

Emission estimates were calculated based on emission factors provided by Fairbanks Morse and from the U.S. Environmental Protection Agency (EPA) *Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1: Chapter 3 Stationary Internal Combustion*

Sources, Section 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines. Emission estimates, assumptions, and manufacturer references are provided in Appendix E.

The following assumptions were used to calculate the potential to emit emissions for the facility:

1. Operation of the five Fairbanks Morse engines is based on 8,760 hours per year at full load.
2. Natural gas and sulfur diesel oil 0.5 percent (wt.) will be used for combustion in the engines. The engines are capable of accommodating combustion of liquid bio-diesel fuel. If bio-diesel fuel is to be combusted, permitting obligations will be reviewed, and a modification will be submitted to the IDEQ as appropriate.
3. A catalyst will be used for each engine sized to reduce CO emissions by 65 percent at 100 percent load operation.

Potential emissions of criteria pollutants are shown in Table 1.

TABLE 1
Potential to Emit Criteria Pollutant Summary

Source ID	Stationary Sources	Emission Rate (ton/year)						Emission Rate (lb/hr)					
		PM	PM-10	NOx	SO2	CO	VOC	PM	PM-10	NOx	SO2	CO	VOC
	Point Source												
9-Cyl Enviro	2- 9 Cylinder Enviro Engines	19.73	19.73	62.1	5.64	73.89	49.67	4.51	4.51	14.18	1.29	16.87	11.34
12-Cyl Enviro	3- 12 Cylinder Enviro Engines	39.51	39.51	124.3	11.29	147.96	99.47	9.02	9.02	28.39	2.58	33.78	22.71
Tank1	Diesel Storage Tank						0.002						0.0004
	Total Stationary Sources	*59.2*	*59.2*	*186.4*	*16.93*	*221.9*	*149.14*	*13.53*	*13.53*	*42.56*	*3.86*	*50.65*	*34.05*

Potential emissions of toxic air pollutants are shown in Table 2.

TABLE 2
Potential to Emit Toxic Pollutant Summary

Pollutant	9 Cyl -Enviro Engines - Dual Fuel (lb/hr)	12 Cyl-Enviro Engines - Dual Fuel (lb/hr)	Diesel Tank Emissions (lb/hr)	Total TAPS (lb/hr)
Benzene	3.12E-02	6.25E-02	3.58E-07	9.37E-02
Toluene	1.13E-02	2.26E-02	1.43E-05	3.40E-02
Xylenes	7.76E-03	1.55E-02	1.30E-04	2.34E-02
Formaldehyde	3.17E-03	6.35E-03		9.53E-03
Acetaldehyde	1.01E-03	2.03E-03		3.04E-03

TABLE 2
Potential to Emit Toxic Pollutant Summary

Pollutant	9 Cyl -Enviro Engines - Dual Fuel (lb/hr)	12 Cyl-Enviro Engines - Dual Fuel (lb/hr)	Diesel Tank Emissions (lb/hr)	Total TAPS (lb/hr)
Acrolein	3.17E-04	6.35E-04		9.52E-04
Naphthalene	5.23E-03	1.05E-02		1.57E-02
Benzo(a)pyrene*	1.03E-05	2.07E-05		3.10E-05
Hexane			4.47E-08	4.47E-08
Ethylbenzene			5.82E-06	5.82E-06
Total PAH	4.26E-03	8.54E-03		1.28E-02

Notes:
[1] Emission factors for all pollutants, except SO_2 and air toxics, are from Performance Data sheet from Fairbanks Morse. Optimized for NOx emission factors are used.
[2] PM emission factor is assumed to equal PM_{10}.
[3] SO_x emission factor from EPA AP-42, Section 3.4 Large Stationary Diesel and All Stationary Dual Fuel Engines,Table 3.4-1.
SO_x EF calculation: 4.06E-04(.5)+9.57E-03(.0007) = 0.0002 lb/hp-hr.
[4] Toxic emission factors were used from EPA AP-42, Section 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines, Tables 3.4-3 and 3.4-4.

Calculations of all air emissions are included in the attachment.

5.0 Facility Classification

The EnviroDyne facility will be a major source for Title V purposes with potential emissions equal or greater than 100 tons per year for NOx, CO, and VOC. The source will not be major as defined by Prevention of Significant Deterioration regulations in 40 CFR 52.21, as no pollutants will have potential emissions equal to or greater than 250 tons per year of any regulated pollutant. The EnviroDyne facility is not a listed (that is, a 100-tons-per-year (tpy) threshold) source under 40 CFR 52.21(b)(1)(iii)(a).

EnviroDyne will be classified as an area (minor) source for Hazardous Air Pollutants (HAP) with total potential aggregate HAP emissions of less than 25 tons per year and emissions of any single HAP of less than 10 tons per year.

6.0 Ambient Impact Analysis

An air dispersion modeling protocol was prepared by CH2M HILL and submitted to IDEQ on February 7, 2007, and is attached as Appendix F. The source parameters and modeling assumptions were identified within the modeling protocol. The protocol was approved through e-mail by Kevin Schilling of IDEQ on February 9, 2007. A copy of the air dispersion modeling protocol and the final modeling report and the IDEQ approval letter is included in Appendix F.

Air dispersion modeling was conducted in accordance with the IDEQ-approved protocol except for changes described in the final modeling report. Facility-wide emission rates were modeled to establish compliance with the primary and secondary emission standards (National Ambient Air Quality Standards [NAAQS]) for particulate matter with a nominal aerodynamic diameter less than or equal to 10 microns (PM_{10}). Dispersion modeling was also performed for the other criteria pollutants (NOx, CO, and SO_x). Idaho toxic air pollutants (TAPs) were first screened against the hourly emission levels in IDAPA 58.01.01.585 and IDAPA 58.01.01.586. Dispersion modeling was required for TAPs exceeding emission screening levels. CH2M HILL successfully demonstrated pre-construction compliance.

Detailed emissions screening for criteria pollutants and TAPs are provided with the emission estimates included in Appendix E. Ambient air is defined as the property fence line along the property boundary. Process emission sources (the five dual fuel engines) were included in the dispersion model. The vent on the diesel storage tank was considered an insignificant source for modeling purposes because inclusion of the TAPs from the storage tank does not change the aggregate toxic emissions rates. Emissions from this storage tank were accounted for in the permit application.

Background emissions data were obtained from the IDEQ. The background data for all pollutants except for PM_{10} were based on parameters obtained from the IDEQ. Background PM_{10} data were obtained from a report entitled *"Proposed Alternative Background Concentrations – Mini-Cassia Facility"* prepared by Geomatrix for The Amalgamated Sugar Company, dated January 17, 2007. Background PM_{10} concentrations in this report were collected from areas in rural areas (Rupert, Idaho) that are similar to the Wendell site. Based on this report, a 24-hour background PM_{10} concentration of 46.6ug/m3 was selected for modeling purposes. The Geomatrix report is included as an attachment in Appendix F.

Weather data from the Twin Falls airport were also obtained from the IDEQ. A combination of Twin Falls surface data and Boise upper air data was used to model all emissions for the proposed Wendell facility. These data were used to model all emissions for the proposed Wendell facility. The modeling results demonstrate compliance with the NAAQS and acceptable ambient concentrations for carcinogens per IDAPA 58.01.01.586. Electronic emission estimates and modeling files are included on a CD with the application.

7.0 Applicable Requirements

A regulatory analysis was performed for the EnviroDyne facility to determine the applicability of the state and federal air quality regulations. The regulatory applicability determinations are included in this section.

The following sections address air quality regulatory compliance requirements for the EnviroDyne facility. As detailed below, the source will comply with all applicable Idaho air quality regulations codified in IDAPA 58.01.01, as well as applicable EPA Code of Federal Regulations (CFR).

Federal Regulations

New Source Review and Prevention of Significant Deterioration Applicability—40 CFR Parts 51 and 52

In accordance with EPA and IDAPA 58.01.01. 205 rules, the proposed facility will not be required to submit a construction permit application subject to the requirements of New Source Review (NSR) as it is not a major new source. The requirements of NSR vary, depending on whether the proposed facility will be located in a non-attainment or attainment area for NAAQS.

New Source Review for Non-Attainment Areas

Non-Attainment Area NSR is the portion of NSR that applies to areas that are not in attainment of NAAQS. Gooding County is classified as attainment or unclassifiable for all NAAQS. Therefore, Non-Attainment Area NSR is not required for the proposed facility.

New Source Review for Attainment or Unclassifiable Areas

Prevention of Significant Deterioration (PSD) is the portion of NSR that applies to pollutants that are in attainment of NAAQS, or are unclassifiable. Gooding County is classified as attainment or unclassifiable for the criteria pollutants NO_X, CO, SO_2, ozone, lead, and PM_{10}. Therefore, new or modified air emission sources are potentially subject to PSD review for these pollutants, depending on the proposed facility's major source status and on the emission rates of NO_X, CO, SO_2, VOC, and PM_{10}.

A PSD review is required if the proposed facility is a major PSD source. A source is considered to be major if:

1. It is included in a list of 28 specific source categories and its potential to emit any of the NSR-regulated pollutants exceeds 100 tpy, or
2. If its PTE exceeds 250 tpy for any other source category.

The list of 28 specific source categories with the 100-tpy threshold does not include compression ignition electrical power generators. Therefore, the proposed source is not subject to a 100-tpy major source threshold for PSD review.

The proposed facility could only be considered to be a PSD major source if it has a potential to emit (PTE) greater than 250 tpy of any criteria pollutant. The proposed facility will not have a PTE greater than 250 tpy for NO_X, CO, VOC, and PM_{10}, and will not be considered a major PSD source.

New Source Performance Standards—40 CFR Part 60

Internal combustion compression ignition engines are not subject to a New Source Performance Standard (NSPS). There is an NSPS standard for petroleum storage vessels constructed after July 23, 1984, Subpart Kb. This NSPS applies to tanks that have a storage capacity of 75m3 (19,813 gallons), or greater. The diesel storage tank will have a storage capacity of 12,000 gallons and is not subject to this NSPS.

National Emission Standards for Hazardous Air Pollutants—40 CFR Part 63

Section 112 of the Clean Air Act (CAA) Amendments relates to the release of air toxic contaminants. The requirements of CAA Section 112(g) or (j) are not applicable because the facility is not a major source of hazardous air pollutants (HAP) (40 CFR 63.40(b)). Part 63 NESHAPS applies to major sources of HAP, defined as PTE equal to or greater than 10 tpy for any single HAP or PTE equal to or greater than 25 tpy for total HAP. HAP emissions from the facility will be below these threshold amounts.

Acid Rain Deposition Control Program—40 CFR Part 72, 73, 74, and 75

The acid rain deposition control program applies to electric utility steam-generating units. The proposed facility is not a steam generating unit and not subject to the acid rain deposition control program based on the definition of an affected unit.

Title V Operating Permit Program—40 CFR Part 70

The CAA requires states to develop an operating permit program (40 CFR Part 70) for major sources. The Idaho Administrative Code IDAPA 58.01.01.300 outlines the requirements for a Title V permit in conjunction with the CAA. In accordance with IDAPA 58.01.01.313.01.d.ii, EnviroDyne will submit a Tier I operating permit application within 1 year of commencing operation.

Protection of Stratospheric Ozone—40 CFR Part 82

Refrigerants that contain ozone-depleting substances are regulated under the Stratospheric Ozone Protection Program (40 CFR 82). The applicable requirements under this program will be performed including maintenance of equipment containing substances (such as, comfort coolers).

Accidental Release Prevention Program—40 CFR Part 68

The storage or use of listed hazardous substances above threshold amounts will not occur at the EnviroDyne facility. A Risk Management Plan (RMP) as described under Part 68 will not be required.

Compliance Assurance Monitoring (CAM)—40 CFR Part 64

The CAM rule (40 CFR 64) applies to each Pollutant Specific Emissions Unit (PSEU) when it is located at a major source that is required to obtain Title V, Part 70 or 71 permit and it meets all of the following criteria:

The PSEU must:

- be subject to an emission limitation or standard
- use a control device to achieve compliance
- have potential pre-control emissions that exceed or are equivalent to the major source threshold

EnviroDyne will not be required to develop a CAM Plan under Part 64. Emissions of CO will be controlled by specific emissions devices, but emissions from each unit will be less

than major source thresholds. The three criteria for CAM applicability will not be met, and a CAM Plan is not required.

IDAPA Regulations

IDAPA 58.01.01.123
CERTIFICATION OF DOCUMENTS

"All documents, including but not limited to, application forms for permits to construct, application forms for operating permits, progress reports, records, monitoring data, supporting information, requests for confidential treatment, testing reports or compliance certifications submitted to the Department shall contain a certification by a responsible official. The certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."

IDAPA 58.01.01.124
TRUTH, ACCURACY AND COMPLETENESS OF DOCUMENTS.

"All documents submitted to the Department shall be truthful, accurate and complete."

IDAPA 58.01.01.125
FALSE STATEMENTS

"No person shall knowingly make any false statement, representation, or certification in any form, notice, or report required under any permit, or any applicable rule or order in force pursuant thereto."

IDAPA 58.01.01.130
STARTUP, SHUTDOWN, SCHEDULED MAINTENANCE, SAFETY MEASURES, UPSET AND BREAKDOWN.

1. Internal Combustion Engines (all units)

If an excess emission event occurs during startup, shutdown, scheduled maintenance, safety measures, upset or breakdown, EnviroDyne will comply with IDAPA 58.01.01.130 through 58.01.01.136.

In the event of an upset or breakdown of an engine, the malfunctioning unit would be shut down. This includes any malfunction that could create excess emissions.

IDAPA 58.01.01.156
TOTAL COMPLIANCE

"Where more than one (1) section of these rules applies to a particular situation, all such rules must be met for total compliance, unless otherwise provided for in these rules."

IDAPA 58.01.01.157
TEST METHODS AND PROCEDURES

1. Internal Combustion Engines (all units)

If an emission test is required, EnviroDyne will adhere to procedures outlined in IDAPA 58.01.01.157.

IDAPA 58.01.01.161
TOXIC SUBSTANCES

1. Internal Combustion Engines (all units)
2. 12,000 gallon diesel fuel tank

"Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation."

Please see emission calculations in Appendix E and modeling results in Appendix F.

IDAPA 58.01.01.200
PROCEDURES AND REQUIREMENTS FOR PERMITS TO CONSTRUCT

1. Internal Combustion Engines (all units)
2. 12,000 gallon diesel fuel tank

Upon approval of the 15-Day PTC by DEQ, EnviroDyne will follow the procedures and requirements outlined under IDAPA 58.01.01.200 for obtaining a PTC.

IDAPA 58.01.01.210
DEMONSTRATION OF PRECONSTRUCTION COMPLIANCE WITH TOXIC STANDARDS

1. Internal combustion Engines (all units)

"In accordance with Subsection 203.03, the applicant shall demonstrate preconstruction compliance with Section 161 to the satisfaction of the Department. The accuracy, completeness, execution and results of the demonstration are all subject to review and approval by the Department."

Please see emission calculations in Appendix E and modeling results in Appendix F.

IDAPA 58.01.01.213
PRE-PERMIT CONSTRUCTION

1. Internal Combustion Engines (all units)
2. 12,000 gallon diesel fuel tank

EnviroDyne will comply with procedures and regulations outlined in this section in order to obtain the 15-Day PTC.

> IDAPA 58.01.01.213.02. **Permit to Construct Procedures for Pre-Permit Construction**

IDAPA 58.01.01.213.02.a Informational Meeting

"Within ten (10) days after the submittal of the pre-permit construction approval application, the owner or operator shall hold an informational meeting in at least one (1) location in the region in which the stationary source or facility is to be located. The informational meeting shall be made known by notice published at least ten (10) days before the meeting in a newspaper of general circulation in the county(ies) in which the stationary source or facility is to be located. A copy of such notice shall be included in the application."

Please see a copy of the Notice in Appendix A.

IDAPA 58.01.01.220 General Exemption Criteria For Permit to Construct Exemptions

IDAPA 58.01.01.221 Category I Exemption

"No permit to construct is required for a source that satisfies the criteria set forth in Section 220 and the following:"

IDAPA 58.01.01.221.01 Below Regulatory Concern.

"The maximum capacity of a source to emit an air pollutant under its physical and operational design considering limitations on emissions such as air pollution control equipment, restrictions on hours of operation and restrictions on the type and amount of material combusted, stored or processed shall be less than ten percent (10%) of the significant emission rates set out in the definition of significant at Section 006."

The facility does not meet the BRC criteria of a category I exemption outlined in IDAPA 58.01.01.221.01 (Below Regulatory Concern). The maximum capacity of this source to emit an air pollutant is greater than ten percent of the significant emission rate defined in IDAPA 58.01.01.006.90.

IDAPA 58.01.01.300 PROCEDURES AND REQUIREMENTS FOR TIER I OPERATING PERMITS

"The purposes of Sections 300 through 399 are to establish requirements and procedures for the issuance of Tier I operating permits."

On approval of the 15-Day PTC application and in accordance with IDAPA 58.01.01.313.01.d.ii, EnviroDyne will submit a Tier I operating permit application within 12 months of commencing operation. EnviroDyne will comply with sections 300 through 399 when applying for a Tier I operating permit.

IDAPA 58.01.01.577
AMBIENT AIR QUALITY STANDARDS FOR SPECIFIC AIR POLLUTANTS (PM-10, SOx, NOx, CO, Pb)

IDAPA 58.01.01.577.01 **PM-10 Standards**

1. Internal Combustion Engines (all units)

IDAPA 58.01.01.577.01.a Primary and Secondary Standards

IDAPA 58.01.01.577.01.a.i Annual Standard
"Fifty (50) micrograms per cubic meter, as an annual arithmetic mean -- never expected to be exceeded in any calendar year."

IDAPA 58.01.01.577.01.a.ii 24-hr Standard
"One hundred fifty (150) micrograms per cubic meter as a maximum twenty-four (24) hour concentration -- never expected to be exceeded more than once in any calendar year."

IDAPA 58.01.01.577.02 **Sulfur Oxides (Sulfur Dioxide)**

1. Internal Combustion Engines (all units)

IDAPA 58.01.01.577.02.a Primary Standards

IDAPA 58.01.01.577.02.a.i Annual Standard
"Eighty (80) micrograms per cubic meter (0.03 ppm), as an annual arithmetic mean -- not to be exceeded in any calendar year."

IDAPA 58.01.01.577.02.a.ii 24-hr Standard
"Three hundred sixty-five (365) micrograms per cubic meter (0.14 ppm), as an maximum twenty-four (24) hour concentration—not to be exceeded more than once in any calendar year."

IDAPA 58.01.01.577.02.b Secondary Standard
"Secondary air quality standards are one thousand three hundred (1,300) micrograms per cubic meter (0.50 ppm), as a maximum three (3) hour concentration -- not to be exceeded more than once in any calendar year."

IDAPA 58.01.01.577.04 **Nitrogen Dioxide**

1. Internal Combustion Engines (all units)

"Primary and secondary air quality standards are one hundred (100) micrograms per cubic meter (0.05 ppm) -- annual arithmetic mean."

IDAPA 58.01.01.577.05 **Carbon Monoxide Primary and Secondary Standards**
1. Internal Combustion Engines (all units)

IDAPA 58.01.01.577.01.a
"Eight (8) Hour Standard. Ten (10) milligrams per cubic meter (9 ppm) -- maximum eight (8) hour concentration not to be exceeded more than once per year."

IDAPA 58.01.01.577.01.b
"One (1) Hour Standard. Forty (40) milligrams per cubic meter (35 ppm) -- maximum one (1) hour concentration not to be exceeded more than once per year."

IDAPA 58.01.01.577.7 **Lead**

1. Internal Combustion Engines (all units)

"Primary and secondary standards for lead and its compounds, measured as elemental lead, are one and one-half (1.5) micrograms per cubic meter (1.5 ug/m3),

as a quarterly arithmetic mean -- not to be exceeded in any quarter of any calendar year."

IDAPA 58.01.01.578
DESIGNATION OF ATTAINMENT, UNCLASSIFIABLE, AND NONATTAINMENT AREAS

The proposed site for the stationary sources, Gooding County, is in an attainment or unclassifiable area for NO_x, CO, SO_x, ozone, lead and PM_{10}; the appropriate modeling parameters will reflect this designation.

IDAPA 58.01.01.590
NEW SOURCE PERFORMANCE STANDARDS

The proposed sources are not subject to 40 CFR Part 60 – please see compliance review in the federal summary.

IDAPA 58.01.01.591
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

The proposed sources are not regulated under 40 CFR Part 61 and 40 CFR Part 63, since the EnviroDyne facility is below threshold limits.

IDAPA 58.01.01.625
VISIBLE EMISSIONS

1. Internal Combustion Engines (all units)

"A person shall not discharge any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than three (3) minutes in any sixty (60) minute period which is greater than twenty percent (20%) opacity as determined by this section."

It is proposed that EnviroDyne conduct a quarterly inspection of the engine stacks during periods when the engines are in operation. The inspection will be conducted during daylight hours and under normal operating conditions. The inspection will consist of a see/no see evaluation. If any visible emissions are present from the point of emission, appropriate corrective action will be taken as expeditiously as practicable, or a Method 9 opacity test in accordance with the procedures outlined in IDAPA 58.01.01.625 will be performed. Records of the results of each visible emission inspection and each opacity test when conducted will be maintained. The records will include, at a minimum, the date and results of each inspection and test and a description of the following: the assessment of the conditions existing at the time visible emissions are present (if observed), any corrective action taken in response to the visible emissions, and the date corrective action was taken.

IDAPA 58.01.01.650
RULES FOR CONTROL OF FUGITIVE DUST

1. Material Handling
2. Right of ways

ENVIRODYNE will take all reasonable precautions to prevent the generation of fugitive dust as outlined under IDAPA 58.01.01.650-651.

IDAPA 58.01.01.651
GENERAL RULES

1. Material Handling
2. Right of ways

"All reasonable precautions shall be taken to prevent particulate matter from becoming airborne. In determining what is reasonable, consideration will be given to factors such as the proximity of dust emitting operations to human habitations and/or activities and atmospheric conditions which might affect the movement of particulate matter. Some of the reasonable precautions may include, but are not limited to, the following:"

IDAPA 58.01.01.651.01 Use Of Water or Chemicals
"Use, where practical, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land."

IDAPA 58.01.01.651.02 Application Of Dust Suppressants
"Application, where practical, of asphalt, oil, water or suitable chemicals to, or covering of dirt roads, material stockpiles, and other surfaces which can create dust."

IDAPA 58.01.01.651.03 Use Of Control Equipment.
"Installation and use, where practical, of hoods, fans and fabric filters or equivalent systems to enclose and vent the handling of dusty materials. Adequate containment methods should be employed during sandblasting or other operations."

IDAPA 58.01.01.651.04 Covering Of Trucks
"Covering, when practical, open bodied trucks transporting materials likely to give rise to airborne dusts."

IDAPA 58.01.01.651.05 Paving
"Paving of roadways and their maintenance in a clean condition, where practical."

IDAPA 58.01.01.651.06 Removal Of Materials
"Prompt removal of earth or other stored material from streets, where practical."

EnviroDyne will monitor and maintain records of the frequency and the method(s) used (i.e., water) to reasonably control fugitive emissions. A quarterly facility-wide inspection will be conducted of the sources of fugitive emissions during daylight hours and under normal operating conditions to ensure that the methods used to reasonably control fugitive emissions are effective. If fugitive emissions are not being reasonably controlled, EnviroDyne will undertake corrective action as expeditiously as practicable. Records of the results of each fugitive emissions inspection will be maintained. The records will include, at a minimum, the date of each inspection and a description of the following: the facilities assessment of the conditions existing at the time fugitive emissions were present (if

observed), any corrective action taken in response to the fugitive emissions, and the date the corrective action was taken.

Records will be maintained of all fugitive dust complaints received. Appropriate corrective action will be taken as expeditiously as practicable after receipt of a valid complaint. The records will include, at a minimum, the date that each complaint was received and a description of the following: the complaint, the facilities assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

IDAPA 58.01.01.675
FUEL BURNING EQUIPMENT -- PARTICULATE MATTER

1. Internal Combustion Engines (all units)

EnviroDyne will adhere to guidelines under IDAPA 58.01.01.675 through IDAPA 58.01.01.681 with regards to particulate emissions for fuel burning equipment.

IDAPA 58.01.01.676
STANDARDS FOR NEW SOURCES

1. Internal Combustion Engines (all units)

"A person shall not discharge into the atmosphere from any fuel burning equipment with a maximum rated input of ten (10) million BTU's per hour or more, and commencing operation on or after October 1, 1979, particulate matter in excess of the concentrations shown in the following table:"

Fuel Type	Allowable Particulate gr/dscf	Emissions, @Oxygen
Diesel	0.05	3%
Gas	0.015	3%

As detailed in Appendix E, the PM emissions from each internal combustion engine will comply with the applicable IDAPA standard.

EnviroDyne will limit the sources above to comply with process weight limitations outlined under IDAPA 58.01.01.700 through IDAPA 58.01.01.703.

IDAPA 58.01.01.700.02 Minimum Allowable Emission
"Notwithstanding the provisions of Sections 701 and 702, no source shall be required to meet an emission limit of less than one (1) pound per hour."

IDAPA 58.01.01.700.03.b Averaging Period – Worst Case
"One (1) hour of operation representing worst-case conditions for the emissions of particulate matter."

IDAPA 58.01.01.775
RULES FOR CONTROL OF ODORS

EnviroDyne will follow the guidelines set under IDAPA 58.01.01.775 through IDAPA 58.01.01.776 to control odorous emissions from all sources for which no gaseous emission control rules apply.

IDAPA 58.01.01.776
GENERAL RULES

IDAPA 58.01.01.776.01 General Restrictions

"No person shall allow, suffer, cause or permit the emission of odorous gases, liquids or solids into the atmosphere in such quantities as to cause air pollution."

Figures

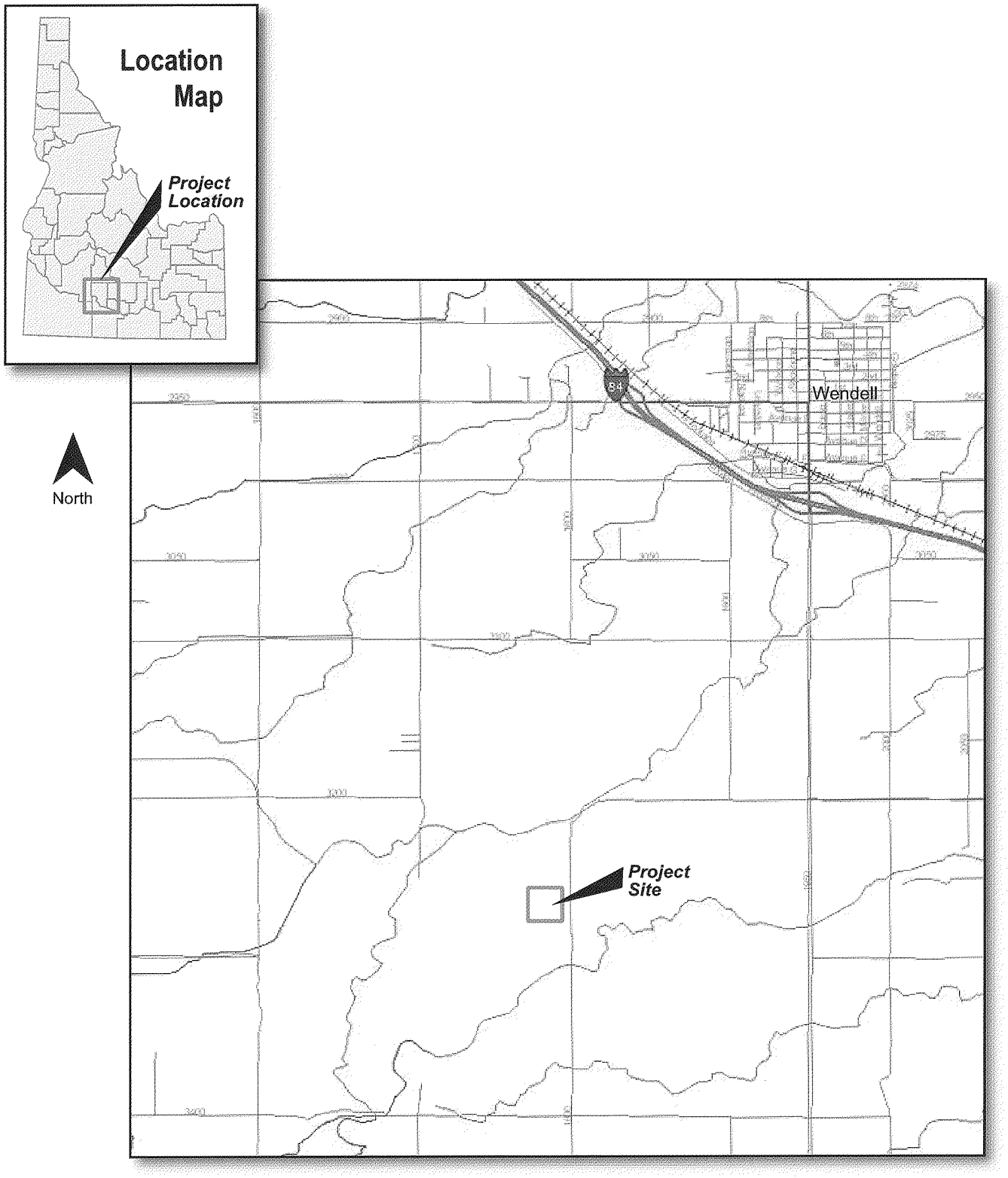


Figure 1
PROJECT LOCATION
EnvironDyne

North

LEGEND

- Property Boundary, Roads
- Property Boundary, Farmland
- EnviroDyne Plant Location

Figure 2
PLANT SITE
EnvironDyne

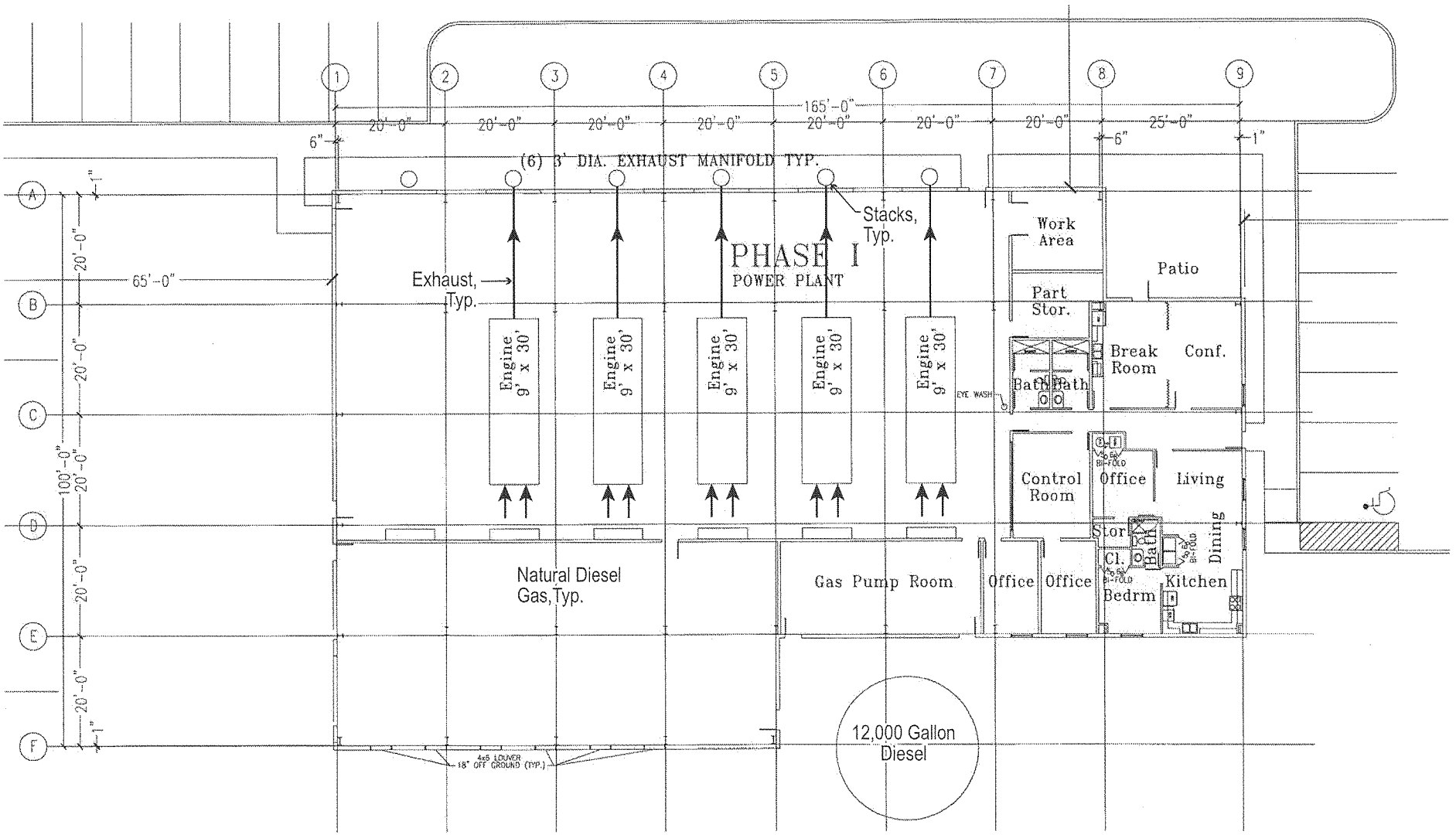


Figure 3
PLOT PLAN AND PROCESS FLOW DIAGRAM
EnvironDyne

Appendix A

Public Meeting Announcement

The Early Files

...late of publication. Ordinance ...87 imposes an interim mora... ...n precluding the acceptance processing of applications for ...ting, subdivision approval and ...ing permits for property locat... ...n the area of impact of the ...of Gooding; and amends the ...ition of subdivision found in ...ding County Ordinance No. 80 ...clude all divisions of land in the ...of Gooding area of impact. The ...osed ordinance would amend ...nance No. 87 to exclude from ...nterim moratorium applications ...building permits for remodel... of existing buildings, for new ...lings on legally divided parcels ...ing as of the effective date of ...ordinance and, for on lots within ...ed subdivisions within the area ...pact of the City of Gooding.

...owing is a summary of the pro... ...ed ordinance:

Ordinance of the County of ...ding, State of Idaho, amend... SECTION 1. INTERIM ...RATORIUM, of Gooding ...nty Ordinance No. 87 to allow ...acceptance and processing of ...lications for building permits for ...odeling of existing buildings, for ...buildings on legally divided ...cels existing as of the effective ...e of this ordinance and for lots ...ated within a platted subdivision ...in the area of impact of the City ...Gooding and providing an effec... ...date.

...ully and complete text of the ...posed ordinance is available at Gooding County Clerk's Office, ...oding County Courthouse, 624 ...in Street, Gooding, Idaho. Office ...urs are 9:00 A.M. to 5:00 P.M., ...nday through Friday.

...ted this 5th day of March, 2007.

...omitted By
...nise Gill
...oding County Clerk
...B: 3/15 G54395

REQUEST FOR BIDS

...Idaho Public Works License on project start date, which shall be not later than June 1, 2007.

PUB: 3/15 G54396

INFORMATIONAL MEETING SET

EnviroDyne Corporation of Wendell will hold a pre-permit public informational meeting on March 22, 2007 from 3:00-4:00 p.m. at Wendell City Hall, 375 East First Street, Wendell ID. This meeting is in accordance with the rules for the Control of Air Pollution in Idaho, IDAPA 58.01.01.213.02 ñ Pre-Permit to Construct Procedures. The purpose of this meeting is to inform the general public of EnviroDyne's request to construct a new stationary source in Wendell, ID. This source will consist of 5 combustion engines burning natural gas and diesel for the generation of 12 megawatts of electrical power. The electrical power will be supplied to the local grid. Persons familiar with this project will be available at this public informational meeting.

PUB: 3/15 G54397

NOTICE OF PUBLIC HEARING

Notice is hereby given that a public hearing will be held in the Municipal Building of the City of Gooding at 6:45 p.m. on March 19, 2007.

The purpose of this hearing is to correct the irrigation assessments of the City with regard to a fair and equitable restructuring of assessment rate schedules for all property owners within the City of Gooding. Irrigation water is in trust with the City and continues to be owned by each individual property owner in Gooding. The City must pay operation, maintenance and accounting charges yearly for the delivery of irrigation water to the City system. Idaho State Law indicates that these charges should be fairly distributed among property owners and users proportionate to utilization.

All citizens are invited to attend and comment on this matter.

/s/Carmen L. Korsen, City Clerk

16 in Block 121, Wendell Townsite, Gooding County, Idaho, as the same is platted in the Official Plat thereof, now of record in the Office of the Recorder of said County. Together with that portion of Avenue E. vacated by Ordinance No. 72, dated February 16, 1921. The Trustee has no knowledge of a more particular description of the above-referenced Property but, for purposes of compliance with Section 60-113 of Idaho Code, the Trustee has been informed that the address of 480 South Milner, Wendell, ID 83355, is sometimes associated with said real property. Said sale will be made without covenant or warranty regarding title, possession or encumbrances to satisfy the obligation secured by and pursuant to the power of sale conferred in the Deed of Trust executed by James D. Draper and Donna J. Draper, husband and wife, as Grantor, to Gooding Title & Escrow, as Trustee, for the benefit and security of Beneficial Mortgage Co. of Idaho, as Beneficiary, dated 6/14/2002, recorded 6/19/2002, under Instrument No. 195741, Mortgage records of Gooding County, Idaho, the beneficial interest in which is presently held by Beneficial Mortgage Co. of Idaho. The above Grantors are named to comply with Section 45-1506(4)(A), Idaho Code. No representation is made that they are, or are not, presently responsible for this obligation. The default for which is sale is made is the failure to pay when due under the Deed of Trust Note dated 6/14/2002, the monthly payment which became due on 9/19/2006 and all subsequent monthly payments, plus late charges and other costs and fees as set forth. Amount Delinquent as of January 29, 2007 $2,821.04 All delinquencies are now due, together with unpaid and accruing taxes, assessments, trustee's fees, attorney's fees, costs and advances made

http://www.rtrustee.com ASAP# 825489 03/08/2007, 03/15/2007, 03/22/2007, 03/29/2007

PUB: 3/8 - 3/29 G55068

NOTICE OF ELECTION

NOTICE IS HEREBY GIVEN that an election will be held on March 26, 2007, from 12:00 noon to 8:00 p.m. at the Hagerman City Office for election of three members to serve on the Lower Snake River Aquifer Recharge District Board of Directors.

The elected members shall be a water user or representative of a water user within the District.

one (1) member shall be a member

...Gooding... Property address: 238 Dorothy Avenue Gooding, ID 83330 Successor Trustee: Northwest Trustee Services, Inc., an Idaho Corporation P.O. Box 997 Bellevue, WA 98009 (425) 586-1900 Deed of Trust information Original grantor: Amee Jo Shipp and Daniel C. Shipp, wife and husband Original trustee: First American Title Original beneficiary: Mortgage Electronic Registration Systems, Inc. solely as nominee for American Mortgage Express Financial dba Millennium Funding Group Recording date: November 23, 2005 Recorder's instrument number: 213993 County: Gooding

address is identified to comply with IC 60-113 but is not warranted to be correct. The property's legal description is: Lot 1 in Block 1 of Strickland Painter Subdivision, to the City of Gooding, Gooding County, Idaho, as the same is platted in the official plat thereof, now of record in the office of the recorder of said County. The sale is subject to conditions, rules and procedures as described at the sale and which can be reviewed at www.northwesttrustee.com or USA-Foreclosure.com. The sale is made without representation, warranty or covenant of any kind. (TS 7261.23482) 1002.68512-FEI

PUB: 3/1 - 3/22 G5438...

NOTICE OF DELINQUENT 2003 TAXES

Notice is hereby given pursuant to Idaho Code 63-1005 that the taxes were duly levied and assessed for the year 2003 have not been paid and are now delinquent upon the hereinafter described real estate in the County of Gooding, State of Idaho. The entry of such delinquency was duly made on January 1, 2004 as required by law; that the time of redemption of said property from said taxes expires on April 20, 2007 at 5:00 PM and if not paid a tax deed will be issued to said County of Gooding, pursuant to Idaho Code 63:1006. The following certificates are listed with the year delinquent, the description of the property, the name and last known address of the persons who are record owners of said properties, and the property address if available. Also given is the total due, including 2% penalty, interest at 1% per month figured to January 31, 2007, and the additional costs of title reports, preparation costs and publication costs. The record owners of said property are further notified that they have a right to be heard, confront and cross examine any witness against them, and obtain and present evidence on their own behalf prior to the issuance of said tax deed. Any objections or questions concerning this notice and information contained herein should be directed to the Gooding County Treasurer, PO Box 326, 624 Main Street, Gooding, Idaho 83330. Phone number 208-934-5673. A hearing has been scheduled with the Gooding County Commissioners for April 23, 2007 at 1:00 P.M. pursuant to deeding property not redeemed. You are hereby notified that if you have any reason you believe there has been an error or any other reason this property should not be deeded you should attend this meeting.

Certificate No. Property Address	Name & Address of Owner	Legal Description	Total Due	Tax Year
RP08S15E304800A 1744 Bob Barton Hwy Wendell	Anderson, Kenneth C. & Anderson, Gregory M P.O. Box 637 Wendell, ID 83355-0637	T8SR15E Sec 30 E2SW4, Lots 3 & 4	$1,519.34	2003
RP07S13E019596A	Polomsky, Anita L. 2727 Miller County 28 Texarkana, AR 71854	T7S R14E Sec 1 Tax 15 in SE4 SE4	$743.58	2003
RP08S15E098600A	Harral, Joey L & Harral, Shelly L 3182-A South 1950 East Wendell, Idaho 83355	T8S R15E Sec 9 Tax 1 in SW4SE4 1SW	$560.66	2003
RPH3000002016AA	Thurman, Steven R & Thurman, Donna M. P.O. Box 10 Hagerman, Idaho 83332-0010	Lot 16 Block 2 Hagerman "MH"	$530.11	2003

PUB: 3/8 G5438...

Appendix B

Fairbanks Morse Engine Data

Opposed Piston Model 38 8 1/8

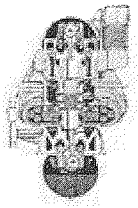
» Return to Previous Page

The Fairbanks Morse Opposed Piston (OP) engine has been designed and developed for a wide array of electrical power generation and heavy industrial applications. You will find OP engines propelling ships, driving locomotives, powering natural gas compressors, running chillers and pump drives, and producing electricity in a variety of marine and stationary applications. OP engines have even provided standby power for the country's most critical applications, including take-home power for nuclear submarines, emergency reactor cooling in nuclear power facilities, and emergency power for vital life support and telecommunications networks.

Regardless of the specific application, economics and environmental concerns determine the best technology - high efficiency and low emissions result in economical power generation and ease of site permitting. When equipped with Enviro-Design®, dual-fuel technology, the OP engine is ideally suited for low-cost electric power production and is one of the most efficient low-emission natural gas engines in the world.

Applications

- Distributed Power Generation
- Prime / Continuous
- Standby / Peak Loading
- Cogeneration / Wastewater Treatment
- Industrial Mechanical Drive - Installations
- Marine - Installations



Opposed Piston Cutaway
Click to enlarge

Engine Construction

Cylinder Block - A "shock qualified," precision-welded steel block designed for structural rigidity and a design life exceeding 40 years. Dry block construction eliminates leakage and extends frame life. Large access openings at five levels in the engine improve maintenance.

Turbocharging - High-efficiency turbocharging and pulse manifolding improves cylinder scavenging, thereby improving efficiency and lowering emissions. Optional Turbo-Blower Series design provides fast-starting and high-load acceptance capability, ideal for combination emergency stand-by and peak shaving applications.

Cylinder Liners - Two pistons inside the cylinder liner form the combustion space, eliminating cylinder heads, valves, and associated hardware. Compared to other engine designs, Opposed Piston engines have less than half the moving parts.

Pistons, Bearings, and Connecting Rods - Upper and lower piston assemblies may be removed from the lower crankcase, simplifying maintenance procedures. Connecting rods are forged from high-tensile-strength alloy steel. Due to the Opposed Piston's two-stroke cycle design and conservative operating speed (900 and 1000 rpm), aluminum alloy main and rod bearing life is extended.

Engine Data and Typical Dimensions (mm)

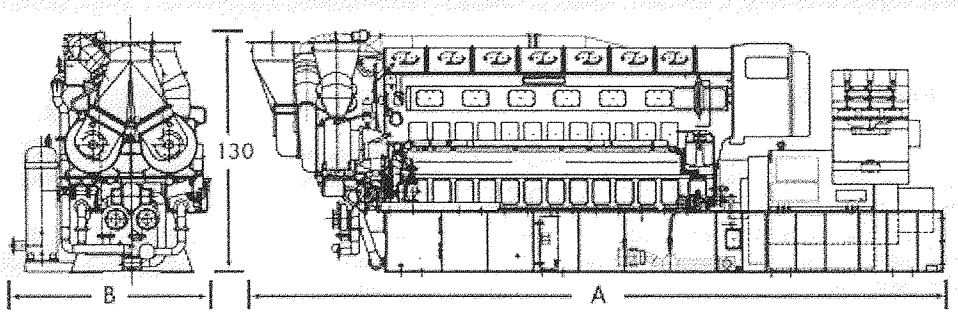
CYL.	RPM	TURBO-BLOWER BHP	TURBO-BLOWER kWe	TURBOCHARGED BHP	TURBOCHARGED kWe	DIMENSIONS A	DIMENSIONS B	DRY WEIGHT LBS

Search FairbanksMo
Site Map
Literature
News & Media
» Search All News &
Contact Informat

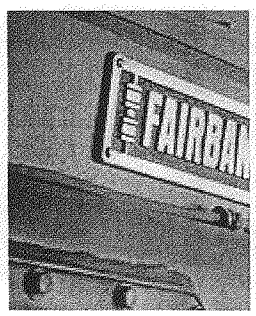
Sales Mgr. Stationary
Kevin Lidbury
kevin.lidbury@fairban

For Engine Parts – C

6	900/1000	2100	1506	2205	1580	6350	2286	53,740
9	900/1000	3150	2260	3308	2370	7620	2794	73,450
12	900/1000	4200	3013	4410	3165	9296	3302	85,025



Drawings are for illustration only. For installation obtain certified prints. All ratings subject to factory approved application and are subject to change without notice.



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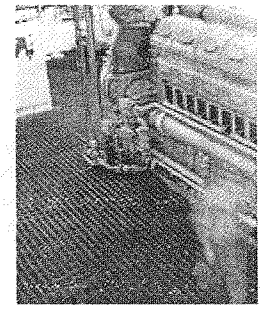


Click to E

Enviro-Design® Technology

» Return to Previous Page

Search FairbanksMo
Site Map

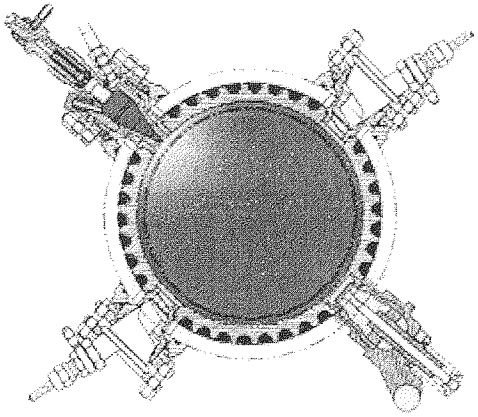
Enviro-Design® Dual Fuel Technology

In the early 1990s, Fairbanks Morse Engine introduced revolutionary dual-fuel combustion technology that reduced NOx exhaust emissions to levels previously achievable with only lean-burn spark-ignited gas engines. When equipped with Enviro-Design® technology, Fairbanks Morse engines utilize pre-combustion chambers to reduce the quantity of pilot diesel fuel required for ignition.

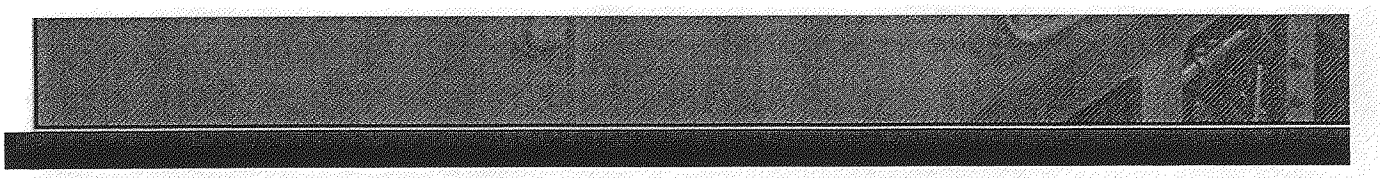
Available with the Opposed Piston, FM-MAN 32/40 DF, and the Colt-Pielstick PC2.5/6, Enviro-Design® technology makes these engines the most efficient low-emission offering in their respective size range.

Benefits of dual-fuel engines equipped with Enviro-Design® technology:

- Nominal 1% Pilot Fuel Requirement - Enviro-Design® engines require a smaller amount of pilot diesel fuel for ignition than competitive engines. This equates to lower fuel costs and storage requirements and inherently lower NOx exhaust emissions.
- Reliability and Availability - Enviro-Design® engines achieve ignition without the need for spark plugs, thus reducing costly downtime associated with plug-related maintenance.
- Fuel Flexibility - Enviro-Design® engines can burn various grades of digester gas as well as pipeline-quality natural gas, at pressures below 100 psig. Diesel fuel operation is always available in the event of an interruption of gaseous fuel supply.
- Higher Output and Efficiency - Each Enviro-Design® engine is supplied with state-of-the-art electronic combustion controls to maximize efficiency and performance.



Shown (left) is the Opposed Piston cylinder liner with Enviro-Design® fuel injection and gas valve components installed. A small quantity of pilot diesel oil is admitted into the pre-combustion chamber for ignition into the main chamber during the compression stroke. The 12 cylinder O-P engine utilizes only 2.9 gallons per hour (approximately 11.0 liters per hour) at 100% rated load.



FAIRBANKS MORSE ENGINE

Opposed Piston Engines

GENERAL ENGINE DATA

OPA1802-1
May 2003

PERFORMANCE DATA
- Enviro-Design® Dual Fuel Engines -

900 RPM Turbocharged
Pipeline Quality Natural Gas

Optimized for BSFC

Engine Speed	900 RPM		
Load (%)	50	75	100
Rating Data			
Output, hp/cyl	183.8	275.6	367.5
BMEP, psig	78	116.9	155.9
Diesel Performance			
BSFC (lb/bhp-hr)	0.373	0.356	0.350
Exhaust Emissions			
NO_x, g/bhp-hr	6	7	7.5
CO, g/bhp-hr	1	0.9	0.9
THC, g/bhp-hr	0.4	0.3	0.3
Smoke, Bosch	0.5	0.5	0.5
Dual Fuel Performance			
BSFC (Btu/bhp-hr)	7200	6600	6250
Exhaust Emissions			
NO_x, g/bhp-hr	1.4	1.4	1.4
CO, g/bhp-hr	4	3.5	3
THC, g/bhp-hr	6	5.5	5
VOC, g/bhp-hr	0.8	0.7	0.6
Smoke, Bosch	0.1	0.1	0.1

Optimized for NOx

Engine Speed	900 RPM		
Load (%)	50	75	100
Rating Data			
Output, hp/cyl	183.8	275.6	367.5
BMEP, psig	78	116.9	155.9
Diesel Performance			
BSFC (lb/bhp-hr)	0.379	0.361	0.355
Exhaust Emissions			
NO_x, g/bhp-hr	6	6	6
CO, g/bhp-hr	1	1	1
THC, g/bhp-hr	0.5	0.5	0.5
Smoke, Bosch	0.5	0.5	0.5
Dual Fuel Performance			
BSFC (Btu/bhp-hr)	7450	6800	6400
Exhaust Emissions			
NO_x, g/bhp-hr	1	1	1
CO, g/bhp-hr	4.5	4	3.4
THC, g/bhp-hr	7	6.5	6
VOC, g/bhp-hr	1	0.9	0.8
Smoke, Bosch	0.1	0.1	0.1

- Ratings based on 0 – 2500 ft. elevation, 90°F ambient temperature.
- Emissions based on EPA reference ambient conditions and 95°F cooling water.
- Dry pipeline quality natural gas (PQNG) – 900 (± 5%) Btu/ft^3 LHV.
- Diesel fuel consumption is based on #2 diesel fuel corrected to 18,190 Btu/lb, LHV.
- BSFC of 12-cylinder engine is 1% higher.
- Pilot fuel quantities – less than 1.49%.
- The above values for fuel consumption and exhaust emissions are expected values to be used with preliminary engineering information with budget proposals. A guarantee will be made based on one of the above values depending on customer priority, i.e. NOx or fuel consumption, with other values established after application review. A guarantee will be provided for 100% load operation only.
- Gas pressure of 70 psig required at engine inlet.

Volume of Dry Products of Combustion for FME engines - Wendell Power Plant

The following computations are based on the following assumptions:

Standard Conditions - 68°F at 14.7 psia		Units	
Air Density	0.075	lbs/cu.ft	
CO2 Density	0.1142	lbs/cu.ft	
Natural Gas heating value	21,518	BTU/lb	LHV
Ratio of CO2 per lbs of Fuel	2.75	lbs	
Ratio of H2O per lbs of Fuel	2.25	lbs	
Ratio of Oxygen required per	4	lbs/lb	
Ratio of Air required per lbs/fuel	19.04	lbs	

Common Engine Parameters:	Enviro		TBS-TDD
Fuel Rate	6,250	BTU/bhp-hr	6,580
Air Flow	1,290	SCFM/Cyl	1,155
"	5,810	lbs/hr/Cyl	5,200
Generator Efficiency	95.8	percent	95.8

Engine Specific Parameters

Engine Type	Units	Enviro	Enviro	TBS
Number of Cylinders	#	9	12	12
Number of Engines	#	2	2	1
Rating	KW	2,300	3,070	2,500
"	BHP	3,218	4,296	3,498
Air Flow	SCFM	11,610	15,480	13,860
"	lbs/hr	52,290	69,720	62,400
" Check	lbs/hr	52,245	69,660	62,370
Fuel Consumption	BTU/hr	20,114,235	26,848,131	23,017,681
	lbs/hr	934.76	1,247.71	1,069.69

Products of Combustion

H_2O	lbs/hr	2,103	2,807	2,407	
CO_2	lbs/hr	2,571	3,431	2,942	
Air Required	lbs/hr	17,798	23,756	20,367	
Excess Air	lbs/hr	34,492	45,964	42,033	
"	percent	194	193	206	
Dry Standard CFM	dscfm	7,665	10,214	9,341	Excess Air
"		375	501	429	CO_2
"		8,040	10,715	9,770	Total Flow

Computation with 3% excess oxygen:

Air Flow for 3% oxygen		534	713	611	lbs/hr
Dry Standard CFM	3% Air	119	158	136	scfm
	CO_2	375	501	429	dscfm
	Total	494	659	565	dscfm

Parameter	Units	Per Unit Value	See Notes	5 units	6 units
Rating per Unit	KW	2165		10,825	12,990
Generator Efficiency	%	95.8			
Brake Horsepower	HP	3,029		15,147	18,176
Engine Speed	rpm	900			
Heat Balance Data	Units are in BTU/hr or BTU/bhp-hr				
Lube Oil System Parameters:					
Temp @ Engine Out	°F	185			
Heat Release	BTU/bhp-hr	610			
At Rated Load	BTU/hr	1,847,921		9,239,605	11,087,526
Lube Oil Flow	gpm	375			
	lbs/hr	166,500			
Temp Differential	°F	22			
Temp @ Engine In	°F	163			
Jacket Water System Paramters:					
Temp @ Engine Out	°F	165			
Heat Release	BTU/bhp-hr	730			
At Rated Load	BTU/hr	2,211,446		11,057,232	13,268,679
JW Flow	gpm	600			
	lbs/hr	300,000			
Temp Differential	°F	7			
Temp @ Engine In	°F	158			
Combined Heat Release - LO and JW Systems:					
Heat Release	BTU/hr	4,059,367	1, 2	20,296,837	24,356,205
Percent Heat Loss		20.94			
Charge Air System - Air Intercooler:					
Air Temp @ Turbo Outlet	°F	275			
Air Temp @ Cooler Out	°F	120			
Temperature Differential	°F	155			
Air Flow	SCFM	10,395			
	lbs/hr	46,800			
Heat Release	BTU/bhp-hr	550			
	BTU/hr	1,813,500	3	9,067,500	10,881,000
AC Water Flow	gpm	340			
	lbs/hr	170,000			
AC Water Temp - In	°F	110	Max		
AC Water Delta T	°F	11			
AC Water Temp - Out	°F	121			

NOTE: The heat from the AC Water System is usually low grade and not useful for heat recovery for processes except for low temperature. However, this is dependent on the secondary system requirements and temperature range.

Exhaust System Heat Recovery:					
Exhaust Gas Temp (TO)	°F	730	Turbo Discharge		
Exhaust Gas Flow	ACFM	23,850			
	lbs/hr	46,800	same as inlet air flow		
Ambient Reference	°F	90			
Exhaust Heat Difference	°F	640			
Exhaust Heat Loss	BTU/hr	7,488,000	1		
Percent Heat Loss		38.62			
Heat Recovery Outlet	°F	230	estimate		
Temperature Differential	°F	500			
Exhaust Heat Recovery	BTU/hr	5,850,000	2	29,250,000	35,100,000
Water Flow	gpm	500			
	lbs/hr	250,000			
Water Inlet Temp	°F	80			
Temperature Differential	°F	23.4			
Water Outlet Temp	°F	103.4			
Percent Exhaust Heat Recovered		78.125			
Heat to Power Output:					
Power Output Rate	BTU/bhp-hr	2545			
Power Output Heat	BTU/hr	7,709,769	1	38,548,844	46,258,612
Total BTU Disipation		19,257,136	(1)		
		99.32	Percent		
Fuel Inputs:					
Dual Fuel Performance	BTU/bhp-hr	6400			
	BTU/hr	19,388,024		96,940,118	116,328,141
	Therms	193.880235		969.40118	1163.28141
Heat Balance Difference	BTU/hr	130,887			
Percent Difference	Percent	0.68			
Diesel Performance	lbs/bhp-hr	0.355			
	lbs/hr	1,075			
	BTU/lb	18,190			
	BTU/hr	19,562,061		97,810,307	117,372,368
Heat Balance Difference	BTU/hr	304,925			
Percent Difference	Percent	1.56			

NOTES:
Those items listed with a 1 in the 'See Notes' column must add up (en total) to the fuel input in BTU/hr. The Heat to Power Output, compared to the total fuel input, gives the efficiency for the electrical generation of the unit, 39.77 percent in the dual fuel case.

If the heat loses (rejected) Items listed with a 2 in the 'See Notes' column are also recovered then the total heat recovered is 17,619,136 BTU/hr and the total engine efficiency (incuding electrical) is increased to 90.88 percent in the dual fuel case.

If the heat lost to the air intercooler is also recovered, the total heat recovered is increased to 19,432,636 BTU/hr and the total engine efficiency (including electrical) is increased to 100.23 percent in the dual fuel case.

Note: This is the engine heat balance. There is a 4.2 percent loss due to the generator inefficiency that is not reflected here. It shows up as heat loss to the room and can not be recovered except that (in winter at least) offsets the heat necessary to heat the room space.

Appendix C

CO Catalyst Typical Manufacturers Information

FAIRBANKS MORSE ENGINE

701 White Avenue
Beloit, Wisconsin 53511
Tel: 608.364.8005
Fax: 608.364.0382
Kevin.Lidbury@fairbanksmorse.com
www.fairbanksmorse.com

Kevin C. Lidbury
Sales Manager – Commercial
Engine Sales

March 19, 2007

Environ Family of Companies
10400 Overland
Boise, Idaho 83709

Subject: Fairbanks Morse Engine Carbon Monoxide Exhaust Emissions

Dear Brent:

Fairbanks Morse Engine has offered to furnish five (5) dual fuel engine generator sets for the proposed power plant to be built by the Environ Family of Companies at either Wendell or Mountain Home, Idaho. We are modifying our proposed scope of supply to include a carbon monoxide (CO) reduction catalyst capable of reducing engine exhaust emissions of CO by 65%. Once we have the final cost information from our suppliers we will give Environ Family of Companies a price adder for this equipment. You can at that time determine if you want FME to supply the equipment or if you want to procure the equipment directly from the suppliers.

There are several options for suppliers of this equipment such as Universal Silencer in conjunction with Johnson Matthey, Steuller, Miratech, or other industry recognized CO catalyst suppliers.

Fairbanks Morse Engine guarantees the emissions of carbon monoxide (CO) will be at or below the levels stated in the attachment. I trust that this will allow you to proceed with obtaining your Idaho Department of Environmental Quality Permits. If you have any questions or require additional information, please do not hesitate to contact us. We will provide the pricing information as soon as we hear from our suppliers.

Best regards,

Kevin C. Lidbury

Kevin C. Lidbury
Sales Manager-Stationary Engine Sales

KCL/ms

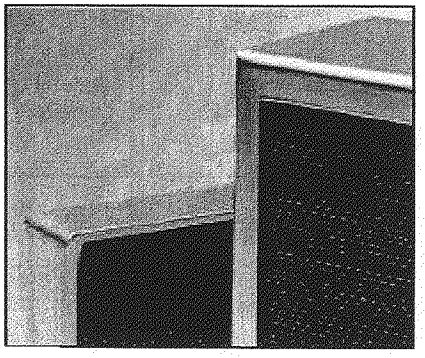
Cc: N. Traeger
V. Stonehocher

CO CATALYST - TYPICAL INSTALLATION MANUFACTURER NOT YET SPECIFIED

EmeraChem

THE POWER OF CATALYSIS

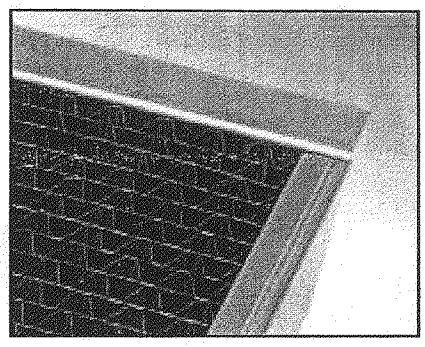
ADCAT™ CO Catalyst



EmeraChem's ADCAT™ CO/VOC oxidation catalyst yields optimal conversion efficiencies with reduced catalyst volume for the lowest capital cost.

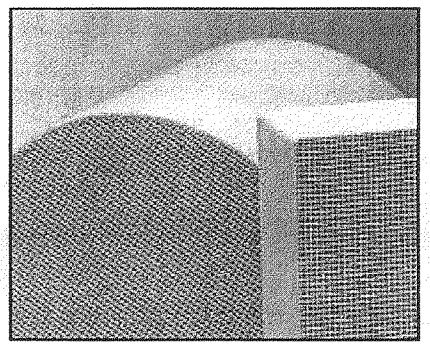
Heavy-duty stainless steel module design:

- High temperature nickel alloy substrate.
- Durable, longest-lasting, highest performance catalyst available.
- Catalyst module cell densities up to 700 cpsi.



Discrete cell substrate construction:

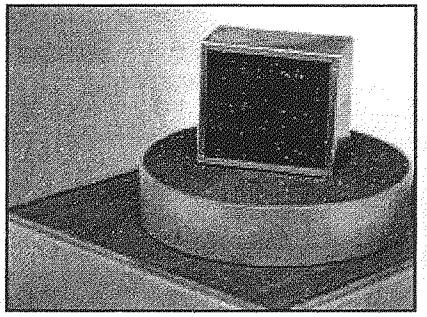
- Ensures maximum durability and extreme module mechanical integrity.
- Yields lowest possible pressure drop for the most surface area.
- Prevents plugging of inter-catalyst channels and sub strate nesting, which cause exhaust bypass and precious metal loss.



Flexibility for meeting future regulations:

- Individually mounted module design, allows for addition and replacement of catalyst modules to existing installations.
- Backed with a three-year warranty and has an expected life of greater than seven years.
- Broad operating temperature range (350 to 1200 °F) allows for simple and seamless integration of CO catalyst systems into all applications.

EmeraChem is a leading, full-service provider of catalysts and catalytic solutions with resources encompassing every aspect required to satisfy customer needs, from analyzing process conditions to delivering the final product.

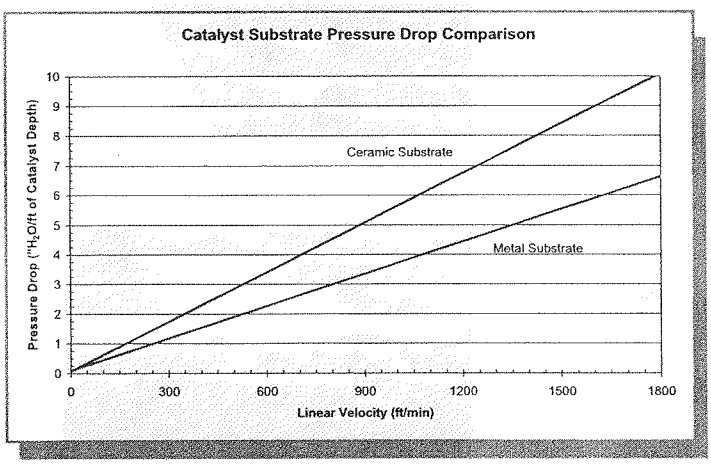


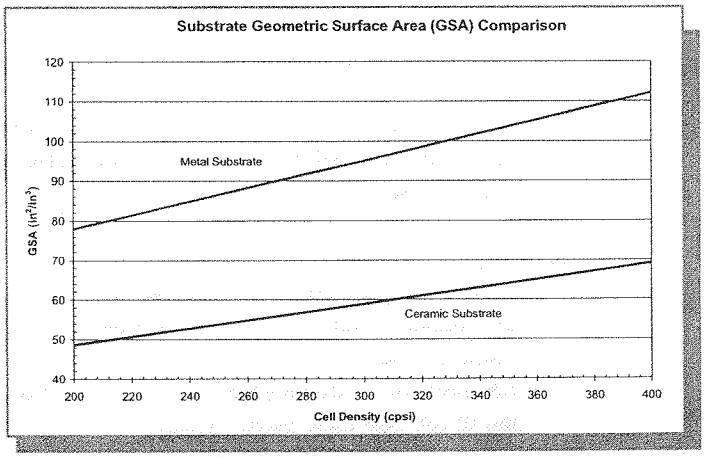
EmeraChem delivers distinctly-focused, customer-specific engineered solutions within budget and on schedule.

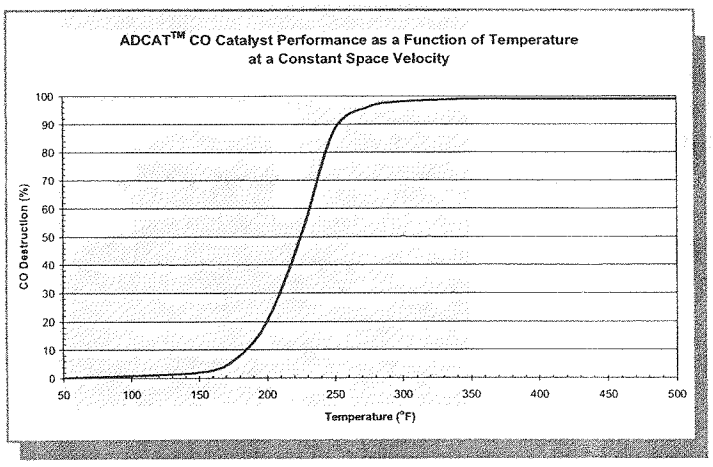
ADCAT™ CO Catalyst: Technical Specifications

Type	Material	Properties			Units	Specifications					
Honeycomb Monolith	Metal Modules	Cell Density			cpsi	200	300	400	500	600	700
		Wall Thickness			in.	0.002	0.002	0.001/0.002	0.001/0.002	0.001/0.002	0.001/0.002
		Geometric Surface Area			in^2/in^3	76.24	97.70	115.10	124.31	145.32	165.55
		Maximum Temperature			°F	1,200	1,200	1,200	1,200	1,200	1,200
		Coefficient of Thermal Expansion			$x10^{-6}in/in/°F$	5.9-8.0	5.9-8.0	5.9-8.0	5.9-8.0	5.9-8.0	5.9-8.0
		Range of Dimensions	Blocks	Height	in.	≤36	≤36	≤36	≤36	≤36	≤36
				Width	in.	≤36	≤36	≤36	≤36	≤36	≤36
				Depth*	in.	1-6	1-6	1-6	1-6	1-6	1-6
			Round	Diameter	in.	≤36	≤36	≤36	≤36	≤36	≤36
				Depth*	in.	1-6	1-6	1-6	1-6	1-6	1-6
	Ceramic Modules	Wall Thickness			in.	0.0105	0.0080	0.0070	n/a	n/a	n/a
		Geometric Surface Area			in^2/in^3	48.20	59.70	68.80	n/a	n/a	n/a
		Maximum Temperature			°F	1,200	1,200	1,200	n/a	n/a	n/a
		Coefficient of Thermal Expansion			$x10^{-6}in/in/°F$	3.91	3.91	3.91	n/a	n/a	n/a
		Range of Dimensions	Blocks	Height	in.	≤42	≤42	≤42	n/a	n/a	n/a
				Width	in.	≤42	≤42	≤42	n/a	n/a	n/a
				Depth*	in.	1-7	1-7	1-7	n/a	n/a	n/a
			Round	Diameter	in.	≤42	≤42	≤42	n/a	n/a	n/a
				Depth*	in.	1-7	1-7	1-7	n/a	n/a	n/a

Listed numbers are nominal values. EmeraChem manufactures catalyst modules in various shapes and sizes.
**For greater depths, multiple units may be stacked to obtain desired dimensions.*







Inquiries.
Send us specifications, drawings or gas stream data and we will provide you with a custom-tailored solution to your specific application. EmeraChem also provides analytical and technical services to assist in determining your current emissions and catalytic performance.

EmeraChem is a proven leader in the catalytic control of NOx, SOx, CO, VOCs and PM for manufacturing and industrial applications as well as for the power generation industry.

EmeraChem LLC
2375 Cherahala Boulevard
Knoxville, Tennessee 37931
Toll Free: 888.777.4538
Tel: 865.246.3000
Fax: 865.246.3001
www.emerachem.com

PCA, Incorporated
3791 Tamarack
Crystal Lake, IL 60012

How Does an Oxidation Catalyst Work?

A catalyst is a substance which promotes certain reactions but is not one of original reactants or final products. In other words, the catalyst is not consumed in the reactions it promotes. Platinum group metals (PGM) including platinum itself, palladium, and rhodium are commonly used in emission control catalysts. Modern catalytic converters utilize a monolith honeycomb substrate which is coated with the PGM metal compounds and packaged into a stainless steel container. The honeycomb is made either of ceramics or stainless steel foil. Its structure of many small parallel channels presents high catalytic contact area to the exhaust gases. As the hot gases flow through the channels and contact the catalyst, several exhaust pollutants are converted into harmless substances. The following reactions occur in the oxidation catalyst:

$$CO + \tfrac{1}{2}O_2 \rightarrow CO_2$$
$$[Hydrocarbons] + O_2 \rightarrow CO_2 + H_2O$$

The hydrocarbon emissions from LPG engines will contain a mixture of propane, butane, ethane, and other compounds. Both CO and hydrocarbons are converted in the oxidation catalyst to carbon dioxide and water vapor which are non-toxic gases. The conversion of CO and HC in the catalyst requires oxygen, as shown in the reaction equations. Usually there is not enough oxygen in the exhaust gases of LPG engines to burn all of the pollutants. Oxidation catalyst systems frequently require that extra air, called secondary air, be introduced into the exhaust system in front of the catalyst.

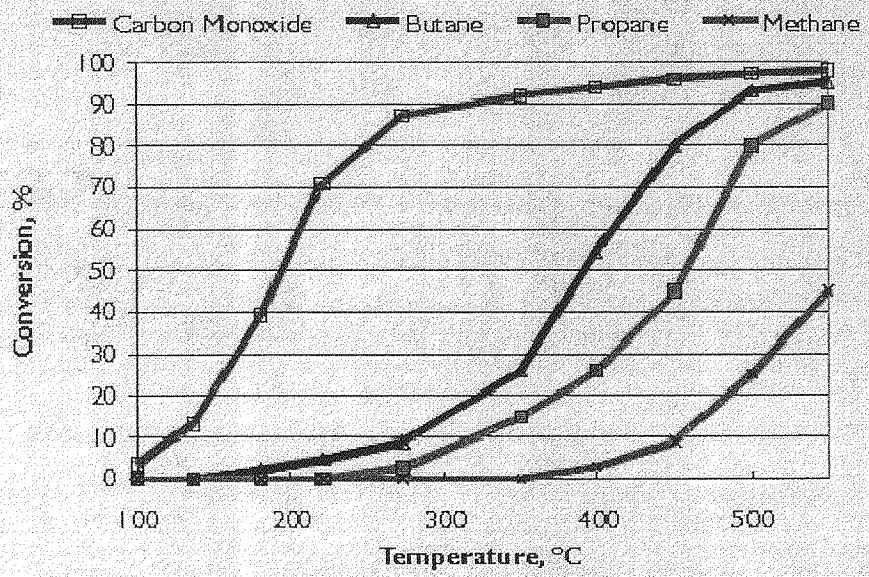


Figure 8. Conversion of CO and Hydrocarbons in Oxidation Catalyst

Typical conversion efficiencies for carbon monoxide and various hydrocarbons (butane, propane, and methane) in the Nett® oxidation catalyst are shown in Figure 8. Catalyst activity increases with temperature. A minimum exhaust temperature of about 200°C is necessary for the catalyst to "light-off". Higher

PCA, Incorporated
3791 Tamarack
Crystal Lake, IL 60012

temperatures are necessary for hydrocarbon conversion. LPG exhaust contains short carbon chain hydrocarbons which are more difficult to convert in the catalyst than those found in diesel or gasoline exhaust. As illustrated in the graph, the shorter the carbon chain the higher the conversion temperature.

Telephones 815-356-7499 815-814-9113(cell) Fax 815-356-0068 Email: dennisk@pcaincorporated.com website: pcaincorporated.c
Air Pollution Control Systems and Consulting Services
Stationary Engine and Turbine VOC, CO, Diesel & NSCR Catalysts and Systems

Precious Metal Recovery, Silencers, Combination Silencers, Blowdown Silencers

Appendix D

IDEQ Application Forms

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 2
02/13/07

Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION	
1. Company Name	EnviroDyne Corporation/Wendell
2. Facility Name (if different than #1)	
3. Facility I.D. No.	Construction of power generation facility
4. Brief Project Description:	
FACILITY INFORMATION	
5. Owned/operated by: (√ if applicable)	☐ Federal government ☐ County government ☐ State government ☐ City government
6. Primary Facility Permit Contact Person/Title	Brent Hessing
7. Telephone Number and Email Address	(208) 322-0777, bhessing@environfoc.com
8. Alternate Facility Contact Person/Title	
9. Telephone Number and Email Address	
10. Address to which permit should be sent	10400 Overland Road #226
11. City/State/Zip	Boise ID 83709
12. Equipment Location Address (if different than #9)	3349 S. 1800 E.
13. City/State/Zip	Wendell, ID 83355
14. Is the Equipment Portable?	☐ Yes ☒ No
15. SIC Code(s) and NAISC Code	Primary SIC: 4911 Secondary SIC (if any): NAICS: 221119
16. Brief Business Description and Principal Product	Electrical power from dual fuel compression ignition engines.
17. Identify any adjacent or contiguous facility that this company owns and/or operates	None
PERMIT APPLICATION TYPE	
18. Specify Reason for Application	☒ New Facility ☐ New Source at Existing Facility ☐ Modify Existing Source: Permit No.:____ Date Issued: ____ ☐ Unpermitted Existing Source: ☐ Required by Enforcement Action: Case No.:____
CERTIFICATION	
IN ACCORDANCE WITH IDAPA 58.01.01.123 (RULES FOR THE CONTROL OF AIR POLLUTION IN IDAHO), I CERTIFY BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THE DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE.	
19. Responsible Official's Name/Title	Brent Hessing, President
20. RESPONSIBLE OFFICIAL SIGNATURE	Date: 3.14.07
21. ☐ Check here to indicate you would like to review a draft permit prior to final issuance.	

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Revision 2
02/13/07

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DEQ USE ONLY
Date Received
Project Number
Payment / Fees Included? Yes ☐ No ☐
Check Number

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER

1. Company Name	EnviroDyne Corporation/Wendell	
2. Facility Name	EnviroDyne Corporation/Wendell	3. Facility ID No.
4. Brief Project Description - One sentence or less	Construction of a new power generation facility.	

PERMIT APPLICATION TYPE

5. ☒ New Facility ☐ New Source at Existing Facility ☐ Unpermitted Existing Source
☐ Modify Existing Source: Permit No.:_____ Date Issued:
☐ Required by Enforcement Action: Case No.:

6. ☒ Minor PTC ☐ Major PTC

FORMS INCLUDED

Included	N/A	Forms	DEQ Verify
☒	☐	Form GI – Facility Information	☐
☒	☐	Form EU0 – Emissions Units General	☐
☒	☐	Form EU1 - Industrial Engine Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU2 - Nonmetallic Mineral Processing Plants Please Specify number of forms attached: _____	☐
☐	☒	Form EU3 - Spray Paint Booth Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU4 - Cooling Tower Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU5 – Boiler Information Please Specify number of forms attached: _____	☐
☐	☒	Form HMAP – Hot Mix Asphalt Plant Please Specify number of forms attached: _____	☐
☐	☒	Form CBP - Concrete Batch Plant Please Specify number of forms attached: _____	☐
☐	☒	Form BCE - Baghouses Control Equipment	☐
☐	☒	Form SCE - Scrubbers Control Equipment	☐
☒	☐	Forms EI-CP1 - EI-CP4 - Emissions Inventory– criteria pollutants (Excel workbook, all 4 worksheets)	☐
☒	☐	PP – Plot Plan	☐
☒	☐	Forms MI1 – MI4 – Modeling (Excel workbook, all 4 worksheets)	☐
☒	☐	Form FRA – Federal Regulation Applicability	☐

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Revision 2
02/14/07

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IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
EnviroDyne Corporation/Wendell	EnviroDyne Corporation/Wendell	
Brief Project Description:	Construction of new power generation facility	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	DIESEL TANK
2. EU ID Number:	TANK
3. EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	TO BE DETERMINED
5. Model:	TO BE DETERMINED
6. Maximum Capacity:	12,000 GALLONS
7. Date of Construction:	FUTURE
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, Complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?:	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐Yes ☐No (If yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	24 HOURS/DAY, 7 DAYS/WEEK
19. Maximum Operation	24 HOURS/DAY, 7 DAYS/WEEK

REQUESTED LIMITS

20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

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PERMIT TO CONSTRUCT APPLICATION

Revision 2
02/13/07

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IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
EnviroDyne Corporation/Wendell	EnviroDyne Corporation/Wendell	
Brief Project Description:	Construction of a new power generation facility	

EXEMPTION

Please refer to IDAPA 58.01.01.222.01.c and d for a list of internal combustion engines that are exempt from the Permit to Construct requirements.

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

1. Type of Unit ☒ New Unit ☐ Unpermitted Existing Unit
☐ Modification to a unit with Permit #: Date Issued:

2. Use of Engine: ☒ Normal Operation ☐ Emergency ☐ Back-up ☐ Other:

3. Engine ID Number:	4. Rated Power:	
ENVIRO1	☒ 3218 Brake Horsepower(bhp) ☐ Kilowatts(kW)	
5. Construction Date:	6. Manufacturer:	7. Model:
Future	Fairbanks Morse	9-Cylinder
8. Date of Modification (if applicable):	9. Serial Number (if available):	10 Control Device (if any):
		CO catalyst

FUEL DESCRIPTION AND SPECIFICATIONS

11. Fuel Type	☒ Diesel Fuel (#) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☒ Natural Gas (cf/hr)	☐ Other Fuels (unit:Bio-Diesel gal/hr)
12. Full Load Consumption Rate	145		19,340	
13. Actual Consumption Rate	145		19,340	
14. Sulfur Content wt%	0.5	N/A	N/A	

OPERATING LIMITS & SCHEDULE

15. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):

16. Operating Schedule (hours/day, months/year, etc.):
24 hours/day; 7 days per week

DEQ AIR QUALITY PROGRAM
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PERMIT TO CONSTRUCT APPLICATION

Revision 2
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IDENTIFICATION		
Company Name: EnviroDyne Corporation/Wendell	Facility Name: EnviroDyne Corporation/Wendell	Facility ID No:
Brief Project Description:	Construction of a new power generation facility	

EXEMPTION

Please refer to IDAPA 58.01.01.222.01.c and d for a list of internal combustion engines that are exempt from the Permit to Construct requirements.

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

1. Type of Unit ☒ New Unit ☐ Unpermitted Existing Unit
☐ Modification to a unit with Permit #: Date Issued:

2. Use of Engine: ☒ Normal Operation ☐ Emergency ☐ Back-up ☐ Other:

3. Engine ID Number:	4. Rated Power:	
ENVIRO2	☒ 3,218 Brake Horsepower(bhp) ☐ Kilowatts(kW)	
5. Construction Date: Future	6. Manufacturer: Fairbanks Morse	7. Model: 9-Cylinder
8. Date of Modification (if applicable):	9. Serial Number (if available):	10 Control Device (if any): CO catalyst

FUEL DESCRIPTION AND SPECIFICATIONS

11. Fuel Type	☒ Diesel Fuel (#) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☒ Natural Gas (cf/hr)	☐ Other Fuels (unit:Biodiesel gal/hr)
12. Full Load Consumption Rate	145		19,340	
13. Actual Consumption Rate	145		19,340	
14. Sulfur Content wt%	0.5	N/A	N/A	

OPERATING LIMITS & SCHEDULE

15. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):

16. Operating Schedule (hours/day, months/year, etc.):
24 hours/day; 7 days per week

DEQ AIR QUALITY PROGRAM
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PERMIT TO CONSTRUCT APPLICATION

Revision 2
02/13/07

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IDENTIFICATION		
Company Name: EnviroDyne Corporation/Wendell	Facility Name: EnviroDyne Corporation/Wendell	Facility ID No:
Brief Project Description:	Construction of a new power generation facility	

EXEMPTION

Please refer to IDAPA 58.01.01.222.01.c and d for a list of internal combustion engines that are exempt from the Permit to Construct requirements.

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

1. Type of Unit ☒ New Unit ☐ Unpermitted Existing Unit
☐ Modification to a unit with Permit #: Date Issued:

2. Use of Engine: ☒ Normal Operation ☐ Emergency ☐ Back-up ☐ Other:

3. Engine ID Number:	4. Rated Power:	
ENVIRO3	☒ 4,296 Brake Horsepower(bhp) ☐ Kilowatts(kW)	
5. Construction Date: Future	6. Manufacturer: Fairbanks Morse	7. Model: 12-Cylinder
8. Date of Modification (if applicable):	9. Serial Number (if available):	10 Control Device (if any): CO catalyst

FUEL DESCRIPTION AND SPECIFICATIONS

11. Fuel Type	☒ Diesel Fuel (#)	☐ Gasoline Fuel	☒ Natural Gas	☐ Other Fuels
	(gal/hr)	(gal/hr)	(cf/hr)	(unit:Biodiesel gal/hr)
12. Full Load Consumption Rate	193.8		25,815	
13. Actual Consumption Rate	193.8		25,815	
14. Sulfur Content wt%	0.5	N/A	N/A	

OPERATING LIMITS & SCHEDULE

15. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):

16. Operating Schedule (hours/day, months/year, etc.):
24 hours/day; 7 days per week

DEQ AIR QUALITY PROGRAM
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IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
EnviroDyne Corporation/Wendell	EnviroDyne Corporation/Wendell	
Brief Project Description:	Construction of a new power generation facility	

EXEMPTION

Please refer to IDAPA 58.01.01.222.01.c and d for a list of internal combustion engines that are exempt from the Permit to Construct requirements.

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

1. Type of Unit ☒ New Unit ☐ Unpermitted Existing Unit
☐ Modification to a unit with Permit #: Date Issued:

2. Use of Engine: ☒ Normal Operation ☐ Emergency ☐ Back-up ☐ Other:

3. Engine ID Number:	4. Rated Power:	
ENVIRO4	☒ 4,296 Brake Horsepower(bhp) ☐ Kilowatts(kW)	
5. Construction Date:	6. Manufacturer:	7. Model:
Future	Fairbanks Morse	12-Cylinder
8. Date of Modification (if applicable):	9. Serial Number (if available):	10 Control Device (if any):
		CO catalyst

FUEL DESCRIPTION AND SPECIFICATIONS

11. Fuel Type	☒ Diesel Fuel (#) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☒ Natural Gas (cf/hr)	☐ Other Fuels (unit:Biodiesel gal/hr)
12. Full Load Consumption Rate	193.8		25,815	
13. Actual Consumption Rate	193.8		25,815	
14. Sulfur Content wt%	0.5	N/A	N/A	

OPERATING LIMITS & SCHEDULE

15. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):

16. Operating Schedule (hours/day, months/year, etc.):
24 hours/day; 7 days per week

Emissions Units - Industrial Engine Information **Form EU1**

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 2
02/13/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name: EnviroDyne Corporation/Wendell	Facility Name: EnviroDyne Corporation/Wendell	Facility ID No:
Brief Project Description:	Construction of a new power generation facility	

EXEMPTION

Please refer to IDAPA 58.01.01.222.01.c and d for a list of internal combustion engines that are exempt from the Permit to Construct requirements.

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

1. Type of Unit ☒ New Unit ☐ Unpermitted Existing Unit ☐ Modification to a unit with Permit #: Date Issued:

2. Use of Engine: ☒ Normal Operation ☐ Emergency ☐ Back-up ☐ Other:

3. Engine ID Number:	4. Rated Power:	
ENVIRO5	☒ 4,296 Brake Horsepower(bhp) ☐ Kilowatts(kW)	
5. Construction Date: Future	6. Manufacturer: Fairbanks Morse	7. Model: 12-Cylinder
8. Date of Modification (if applicable):	9. Serial Number (if available):	10 Control Device (if any): CO Catalyst

FUEL DESCRIPTION AND SPECIFICATIONS

11. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☒ Natural Gas (cf/hr)	☐ Other Fuels (unit:Biodiesel gal/hr)
12. Full Load Consumption Rate	193.8		25,815	
13. Actual Consumption Rate	193.8		25,815	
14. Sulfur Content wt%	0.5	N/A	N/A	

OPERATING LIMITS & SCHEDULE

15. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):

16. Operating Schedule (hours/day, months/year, etc.):
24 hours/day; 7 days per week

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
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PERMIT TO CONSTRUCT APPLICATION

Revision 2
02/14/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name: EnviroDyne Corporation/Wendell	Facility Name: EnviroDyne Corporation/Wendell	Facility ID No:
Brief Project Description: Construction of new power generation facility.		

APPLICABILITY DETERMINATION		
1. Will this project be subject to 1990 CAA Section 112(g)? (Case-by-Case MACT)	☒ NO	☐ YES* * If YES then applicant must submit an application for a case-by-case MACT determination [IAC 567 22-1(3)"b" (8)]
2. Will this project be subject to a New Source Performance Standard? (40 CFR part 60)	☒ NO	☐ YES* *If YES please identify sub-part:
3. Will this project be subject to a MACT (Maximum Achievable Control Technology) regulation? (40 CFR part 63) THIS ONLY APPLIES IF THE PROJECT EMITS A HAZARDOUS AIR POLLUTANT	☒ NO	☐ YES* *If YES please identify sub-part:
4. Will this project be subject to a NESHAP (National Emission Standards for Hazardous Air Pollutants) regulation? (40 CFR part 61)	☒ NO	☐ YES* *If YES please identify sub-part:
5. Will this project be subject to PSD (Prevention of Significant Deterioration)? (40 CFR section 52.21)	☒ NO	☐ YES
6. Was netting done for this project to avoid PSD?	☒ NO	☐ YES* *If YES please attach netting calculations

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the Air Permit **Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 2 02/14/2007
Company Name:	**EnviroDyne Corporation/Wendell**	
Facility Name:	EnviroDyne Corporation/Wendell	
Facility ID No.:		
Brief Project Description:	Construction of new power generation facility	

Please see instructions on next page before filling out the form.

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - POINT SOURCES

		3.											
1.	2.	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	Stack ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Source(s)													
9 Cyl Enviro Engine 1 (Dual Fuel)	ENVIRO1	2.30	9.87	0.60	2.82	7.10	31.05	8.40	36.94	5.70	24.84		
9 Cyl Enviro Engine 2 (Dual Fuel)	ENVIRO2	2.30	9.87	0.60	2.82	7.10	31.05	8.40	36.94	5.70	24.84		
12 Cyl Enviro Engine 3 (Dual Fuel)	ENVIRO3	3.00	13.17	0.90	3.76	9.50	41.45	11.30	49.32	7.60	33.16		
12 Cyl Enviro Engine 4 (Dual Fuel)	ENVIRO4	3.00	13.17	0.90	3.76	9.50	41.45	11.30	49.32	7.60	33.16		
12 Cyl Enviro Engine 5 (Dual Fuel)	ENVIRO5	3.00	13.17	0.90	3.76	9.50	41.45	11.30	49.32	7.60	33.16		
Diesel Tank	TANK1									0.00	0.00		
name of the emissions unit7													
name of the emissions unit8													
name of the emissions unit9													
name of the emissions unit10													
name of the emissions unit11													
name of the emissions unit12													
name of the emissions unit13													
name of the emissions unit14													
name of the emissions unit15													
name of the emissions unit16													
name of the emissions unit17													
name of the emissions unit18													
name of the emissions unit19													
name of the emissions unit20													
name of the emissions unit21													
(insert more rows as needed)													
Total		13.60	59.25	3.90	16.92	42.70	186.45	50.70	221.84	34.20	149.16		

Instructions for Form EI-CP1

This form is designed to provide the permit writer and air quality modeler with a summary of the criteria pollutant emissions of each emission unit/point located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description as on form CS in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the name of all emission units at the facility. This name must match names on other submittals to IDEQ and within this application.

2. Provide the identification number for the stack which the emission unit exits.

3. Provide the emission rate in pounds per hour and tons per year for all criteria pollutants emitted by this point source. In this form, emission rates for a point source are the maximum allowable emissions for both short term (pounds per hour) and long term (tons per year). These emission rates are its permitted limits (if any). Otherwise, potential to emit should be shown. Potential to emit is defined as uncontrolled emissions at maximum design or achievable capacity (whichever is higher) and year-round continuous operation (8760 hours per year) if there are no federally enforceable permit limits on the emission point. If the emission point has or will have control equipment or some other proposed permit limitation such as hours of operation or material usage, then, the control efficiency or proposed permit limit(s) may be used in calculating potential to emit.

NOTE: Attach a separate sheet of paper, or electronic file, to provide additional documentation on the development of the emission rates. Documentation can include emissions factors, throughput, and example calculations.

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the Air Permit **Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 2 02/14/2007

Company Name:	EnviroDyne Corporation/Wendell
Facility Name:	
Facility ID No.:	
Brief Project Description:	Construction of new power generation facility

Please see instructions on next page before filling out the form.

SUMMARY OF AIR IMPACT ANALYSIS RESULTS - CRITERIA POLLUTANTS

		1.		2.	3.	4.		5.
Criteria Pollutants	**Averaging Period**	**Significant Impact Analysis Results (µg/m3)**	**Significant Contribution Level (µg/m3)**	**Full Impact Analysis Results (µg/m3)**	**Background Concentration (µg/m3)**	**Total Ambient Impact (µg/m3)**	**NAAQS (µg/m3)**	**Percent of NAAQS**
PM_{10}	24-hour		5	61.80	46.60	108.40	150	72%
	Annual		1	11.80	26.00	37.80	50	76%
SO_2	3-hr		25	65.00	34.00	99.00	1300	8%
	24-hr		5	19.70	26.00	45.70	365	13%
	Annual		1	3.60	8.00	11.60	80	15%
NO_2	Annual		1	39.70	17.00	56.70	100	57%
CO	1-hr		2000	936.60	3,600.00	4,536.60	10000	45%
	8-hr		500	644.40	2,300.00	2,944.40	40000	7%

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the Air Permit **Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 2 02/14/2007
Company Name:	EnviroDyne Corporation/Wendell	
Facility Name:		
Facility ID No.:		
Brief Project Description:	Construction of a new power generation facility	

Please see instructions on next page before filling out the form.

POINT SOURCE STACK PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	.7	8.	9.	10.
Emissions units	Stack ID	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Modeled Diameter (m)	Stack Exit Temperature (K)	Stack Exit Flowrate (acfm)	Stack Exit Velocity (m/s)	Stack orientation (e.g., horizontal, rain cap)
Point Source(s)										
9 Cylinder Enviro Engine	ENVIRO1				9.75	0.91	661.00		20.94	Vertical
9 Cylinder Enviro Engine	ENVIRO2				9.75	0.91	661.00		20.94	Vertical
12 Cylinder Enviro Engine	ENVIRO3				9.75	0.91	661.00		20.94	Vertical
12 Cylinder Enviro Engine	ENVIRO4				9.75	0.91	661.00		20.94	Vertical
12 Cylinder Enviro Engine	ENVIRO5				9.75	0.91	661.00		20.94	Vertical
name of the emissions unit6										
name of the emissions unit7										
name of the emissions unit8										
name of the emissions unit9										
name of the emissions unit10										
name of the emissions unit11										
name of the emissions unit12										
name of the emissions unit13										
name of the emissions unit14										
name of the emissions unit15										
name of the emissions unit16										
name of the emissions unit17										
name of the emissions unit18										
name of the emissions unit19										
name of the emissions unit20										
name of the emissions unit21										
(insert more rows as needed)										

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the Air Permit **Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 2 02/14/2007
Company Name:	EnviroDyne Corporation/Wendell	
Facility Name:		
Facility ID No.:		
Brief Project Description:	Construction of a new power generation facility	

Please see instructions on next page before filling out the form.

BUILDING AND STRUCTURE INFORMATION

1.	2.	3.	4.	5.	6.	7.
Building ID Number	**Length (ft)**	**Width (ft)**	**Base Elevation (m)**	**Building Height (m)**	**Number of Tiers**	**Description/Comments**
Power Plant	25.00	60.00		7.62		This facility is connected into one building with
Storage	140.00	100.00		12.19		2 tiers: Power Plant (tier 1) and storage (tier 2)

Appendix E

Emission Estimates

Environdyne Power Project
Table 3 - 9-Cylinder Enviro Design Dual Fuel Engine

Engine Brake Horsepower	3,218	
Fuel Type	Natural Gas	
- maximum sulfur content (%)	0.0007	From http://www.ingaa.org/environment/pollutants.htm
Fuel Type	Distillate #2	
- maximum sulfur content (%)	0.5	
Maximum Firing Rate (gals/hr)		
Maximum Heat Input Rating (MMBtu/hr)	20.114	Manufacturer Rated Dual Fuel Performance
Maximum Hours of Operation	8,760	
Maximum Firing Rate (gals/yr)	0	
Heat Value of Fuel (Btu/gal)		
SCR Efficiency for NOx	0%	
Catalyst Efficiency for CO	65%	

			Uncontrolled Potential to Emit			Controlled Potential to Emit		
Criteria Pollutant	Emission Factor[1]	Units	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)[2]	0.0007	lb/bhp-hr	2.3	19,733	9.87	2.3	19,733	9.87
Nitrogen Oxides (NOx)	1.00	g/bhp-hr	7.1	62,092	31.05	7.1	62,092	31.05
Sulfur Oxides[3]	0.0002	lb/bhp-hr	0.6	5,638	2.82	0.6	5,638	2.82
Carbon Monoxide (CO)	3.40	g/bhp-hr	24.1	211,112	105.56	8.4	73,889	36.94
VOC	0.80	g/bhp-hr	5.7	49,673	24.84	5.7	49,673	24.84

				Uncontrolled Potential to Emit				
Compound	CAS Number		Emission Factor[4] (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Benzene	71-43-2		7.76E-04	1.56E-02	1.37E+02	6.84E-02	8.00E-04	Exceeds
Toluene	108-88-3		2.81E-04	5.65E-03	4.95E+01	2.48E-02	2.50E+01	Below
Xylenes	1330-20-7		1.93E-04	3.88E-03	3.40E+01	1.70E-02	2.90E+01	Below
Formaldehyde	50-00-0		7.89E-05	1.59E-03	1.39E+01	6.95E-03	5.10E-04	Exceeds
Acetaldehyde	75-07-0		2.52E-05	5.07E-04	4.44E+00	2.22E-03	3.00E-03	Below
Acrolein	107-02-8		7.88E-06	1.58E-04	1.39E+00	6.94E-04	1.70E-02	Below
Naphthalene	91-20-3		1.30E-04	2.61E-03	2.29E+01	1.15E-02	3.33E+00	Below
Benzo(a)pyrene*	50-32-8		2.57E-07	5.17E-06	4.53E-02	2.26E-05	2.00E-06	Exceeds
Total PAH[5]			1.06E-04	2.13E-03	1.87E+01	9.34E-03	9.10E-05	Exceeds

HAPs	0.131

Notes:

[1] Emission factors for all pollutants except SO_2 are from Performance Data sheet from Fairbanks Morse.Optimized for NOx emission factors are used.

[2] PM emission factor is assumed to equal PM_{10}. Conservative estimate based solely on diesel fuel, Section 3.4 Large Stationary Diesel and All Stationary Dual Fuel Engines,Table 3.4-1

[3] SO_x emission factor from EPA AP-42, Section 3.4 Large Stationary Diesel and All Stationary Dual Fuel Engines,Table 3.4-1

SOx EF calculation: 4.06E-04(.5)+9.57E-03(.0007) = 0.0002 lb/hp-hr

[4] Toxic emission factors were utilized from EPA AP-42, Section 3.4 Large Stationary Diesel and All Stationary Dual Fuel Engines,Tables 3.4-3 and 3.4-4.

[5] Total PAH is based on 1/2 the maximum amount of the pollutant (EPA Region X, 3/21/07)- EPA AP-42, Table 3.4-4

Based on less than symbol which means the compound was tested but not found in any measurable amount.

Environdyne Power Project

Table 1 - Potential to Emit Criteria Pollutant Summary

Modeling ID	Stationary Sources	Emission Rate (ton/year)						Emission Rate (lb/hr)					
		PM	PM-10	NOx	SO2	CO	VOC	PM	PM-10	NOx	SO2	CO	VOC
	Point Source												
	2 - 9 Cylinder Enviro Design Dual Fuel Engines	19.73	19.73	62.09	5.64	73.89	49.67	4.51	4.51	14.18	1.29	16.87	11.34
	3 - 12 Cylinder Enviro Design Dual Fuel Engines	39.51	39.51	124.34	11.29	147.96	99.47	9.02	9.02	28.39	2.58	33.78	22.71
	Diesel Tank						0.0						0.0004
	Total Stationary Sources	**59.25**	**59.25**	**186.43**	**16.93**	**221.85**	**149.14**	**13.53**	**13.53**	**42.56**	**3.86**	**50.65**	**34.05**
	Significant Emission Rates (10%)	**2.5**	**1.5**	**4.0**	**4.0**	**10.0**	**4.0**						
	Modeling Threshold	na	1.0	1.0	1.0	na	na	na	0.2	na	0.2	14.0	na
	Modeling Required		**Yes**	**Yes**	**Yes**				**Yes**		**Yes**	**Yes**	

Environdyne Power Project

Table 2 - Potential to Emit Toxic Pollutant Summary

Pollutant	9 Cyl -Enviro Engines - Dual Fuel (lb/hr)	12-Cyl Enviro Engines - Dual Fuel (lb/hr)	Diesel Tank Emissions (lb/hr)	Total TAPS (lb/hr)	IDAPA 58.01.01.585/ 586 - EL (lb/hr)	PTE Emission Rate vs. EL
Benzene	3.12E-02	6.25E-02	3.58E-07	9.37E-02	8.00E-04	**Exceeds**
Toluene	1.13E-02	2.26E-02	1.43E-05	3.40E-02	2.50E+01	Below
Xylenes	7.76E-03	1.55E-02	1.30E-04	2.34E-02	2.90E+01	Below
Formaldehyde	3.17E-03	6.35E-03		9.53E-03	5.10E-04	**Exceeds**
Acetaldehyde	1.01E-03	2.03E-03		3.04E-03	3.00E-03	**Exceeds**
Acrolein	3.17E-04	6.35E-04		9.52E-04	1.70E-02	Below
Naphthalene	5.23E-03	1.05E-02		1.57E-02	3.33E+00	Below
Benzo(a)pyrene*	1.03E-05	2.07E-05		3.10E-05	2.00E-06	**Exceeds**
Hexane			4.47E-08	4.47E-08	1.20E+01	Below
Ethylbenzene			5.82E-06	5.82E-06	2.90E+01	Below
Total PAH	4.26E-03	8.54E-03		1.28E-02	2.00E-06	**Exceeds**

Environdyne Power Project
Table 4 - 12 Cylinder Enviro Design Dual Fuel Engine

Engine Brake Horsepower	4,296	
Fuel Type	Natural Gas	
- maximum sulfur content (%)	0.0007	From http://www.ingaa.org/environment/pollutants.htm
Fuel Type	Distillate #2	
- maximum sulfur content (%)	0.5	
Maximum Firing Rate (gals/hr)		
Maximum Heat Input Rating (MMBtu/hr)	26.848	Manufacturer Rated Dual Fuel Performance
Maximum Hours of Operation	8,760	
Maximum Firing Rate (gals/yr)	0	
Heat Value of Fuel (Btu/gal)		
SCR Efficiency for NOx	0%	
Catalyst Efficiency for CO	65%	

			Uncontrolled Potential to Emit			Controlled Potential to Emit		
Criteria Pollutant	Emission Factor[1]	Units	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)[2]	0.0007	lb/bhp-hr	3.0	26,343	13.17	3.0	26,343	13.17
Nitrogen Oxides (NOx)	1.00	g/bhp-hr	9.5	82,892	41.45	9.5	82,892	41.45
Sulfur Oxides[3]	0.0002	lb/bhp-hr	0.9	7,527	3.76	0.9	7,527	3.76
Carbon Monoxide (CO)	3.40	g/bhp-hr	32.2	281,833	140.92	11.3	98,641	49.32
VOC	0.800	g/bhp-hr	7.6	66,314	33.16	7.6	66,314	33.16

				Uncontrolled Potential to Emit				
Compound	CAS Number		Emission Factor[4] (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Benzene	71-43-2		7.76E-04	2.08E-02	1.83E+02	9.13E-02	8.00E-04	Exceeds
Toluene	108-88-3		2.81E-04	7.54E-03	6.61E+01	3.30E-02	2.50E+01	Below
Xylenes	1330-20-7		1.93E-04	5.18E-03	4.54E+01	2.27E-02	2.90E+01	Below
Formaldehyde	50-00-0		7.89E-05	2.12E-03	1.86E+01	9.28E-03	5.10E-04	Exceeds
Acetaldehyde	75-07-0		2.52E-05	6.77E-04	5.93E+00	2.96E-03	3.00E-03	Below
Acrolein	107-02-8		7.88E-06	2.12E-04	1.85E+00	9.27E-04	1.70E-02	Below
Naphthalene	91-20-3		1.30E-04	3.49E-03	3.06E+01	1.53E-02	3.33E+00	Below
Benzo(a)pyrene	50-32-8		2.57E-07	6.90E-06	6.04E-02	3.02E-05	2.00E-06	Exceeds
Total PAH[5]			1.06E-04	2.85E-03	2.49E+01	1.25E-02	9.10E-05	Exceeds

HAPs	0.175

Notes:

[1] Emission factors for all pollutants except SO_2 are from

[2] PM emission factor is assumed to equal PM_{10}. Conservative estimate based solely on diesel fuel, Section 3.4 Large Stationary Diesel and All Stationary Dual Fuel Engines,Table 3.4-1

[3] SO_2 emission factor from EPA AP-42, Section 3.4 Large Stationary Diesel and All Stationary Dual Fuel Engines,Table 3.4-1

SOx EF calculation: 4.06E-04(.5)+9.57E-03(.0007) = 0.0002 lb/hp-hr

[4] Toxic emission factors were utilized from EPA AP-42, Section 3.4 Large Stationary Diesel and All Stationary Dual Fuel Engines,Tables 3.4-3 and 3.4-4.

[5] Total PAH is based on 1/2 the maximum amount of the pollutant (EPA Region X, 3/21/07)- EPA AP-42, Table 3.4-4

Based on less than symbol which means the compound was tested but not found in any measurable amount.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Number 1
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	12,000 gallon AST, No. 2 fuel, 13-feet diameter, 12-feet tall.

Tank Dimensions

Shell Length (ft):	12
Diameter (ft):	13
Volume (gallons):	12,000.00
Turnovers:	1
Net Throughput(gal/yr):	12,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d

Emissions Report - Detail Format
Liquid Contents of Storage Tank

Number 1 - Horizontal Tank

		Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol Weight	Liquid Mass Fract
Mixture/Component	Month	Avg.	Min.	Max.		Avg.	Min.	Max.		
Distillate fuel oil no. 2	All	58.15	48.59	67.71	53.16	0.0061	0.0043	0.0084	130	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Number 1 - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	3.6886
Vapor Space Volume (cu ft):	1,014.51
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0696
Vented Vapor Saturation Factor:	0.9979
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,014.51
Tank Diameter (ft):	13
Effective Diameter (ft):	14.097
Vapor Space Outage (ft):	6.5
Tank Shell Length (ft):	12
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130
Vapor Pressure at Daily Average Liquid	
Surface Temperature (psia):	0.0061
Daily Avg. Liquid Surface Temp. (deg. R):	517.8199
Daily Average Ambient Temp. (deg. F):	50.9208
Ideal Gas Constant R	
(psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.8308
Tank Paint Solar Absorptance (Shell):	0.54
Daily Total Solar Insulation	
Factor (Btu/sqft day):	1,400.54

Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0696
Daily Vapor Temperature Range (deg. R):	38.2221
Daily Vapor Pressure Range (psia):	0.0041
Breather Vent Press. Setting Range(psia):	0.06
Vapor Pressure at Daily Average Liquid	
Surface Temperature (psia):	0.0061
Vapor Pressure at Daily Minimum Liquid	
Surface Temperature (psia):	0.0043
Vapor Pressure at Daily Maximum Liquid	
Surface Temperature (psia):	0.0084
Daily Avg. Liquid Surface Temp. (deg R):	517.8199
Daily Min. Liquid Surface Temp. (deg R):	508.2644
Daily Max. Liquid Surface Temp. (deg R):	527.3754
Daily Ambient Temp. Range (deg. R):	23.675
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9979
Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	0.0061
Vapor Space Outage (ft):	6.5
Working Losses (lb):	0.2277
Vapor Molecular Weight (lb/lb-mole):	130
Vapor Pressure at Daily Average Liquid	
Surface Temperature (psia):	0.0061
Annual Net Throughput (gal/yr.):	12,000.00
Annual Turnovers:	1
Turnover Factor:	1
Tank Diameter (ft):	13
Working Loss Product Factor:	1
Total Losses (lb):	**3.9162**

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Number 1 - Horizontal Tank (VOC Emissions)

	Losses(lb/yr)		
Components	Working Loss	Breathing Loss	Total VOC Emissions
Distillate fuel oil no. 2	0.23	3.69	3.92

Source: EPA Tanks Emission Estimation Software Version 4.09D

Number 2 - Horizontal Tank HAPs

HAP	Diesel Liquid Phase Wt[1](%)	HAP Emissions (lb/hr)
Ethylbenzene	0.013	5.82E-06
Hexane	0.0001	4.47E-08
Benzene	0.0008	3.58E-07
Xylene (mixed)	0.29	1.30E-04
Toluene	0.032	1.43E-05

Notes:
[1] Liquid Phase Weight Percent, Volatile Speciation for Diesel based on Air Emissions Inventory Guide Document for Stationary Sources at Air Force Installations (USAF Instituet forEnvironment, Safety, and Occupational Risk Analysis, 1999)

Ex. Calculation: Ethylbenzene = ((3.92 lb/yr)*(0.013))/8,760 hr/yr = 5.82E-06 lb/hr

Environdyne Power Project
PM Standard Calculations

Compliance with IDAPA Rule 677 PM Standard for Fuel Burning Equipment

Unit	9 Cylinder Enviro Dual Fuel	12 Cylinder Enviro Dual Fuel
Fuel	Diesel Fuel	Diesel Fuel
Rated Heat Input (MM Btu/hr)	20.1	26.8
PM Emission Rate (lb/hr)[1]	0.02	0.03
Exit/Flue Gas Flowrate Calculation		
F_d (Table 19-2, EPA Method 19) (dscf/MM Btu) [2,3]	9,190	9,190
Exit flowrate: (dscfm)	3,081	4,112
Exit flow rate corrected: = ACFM(Std T{°R}/Stack T{°R})(Stack P {inHg}/Std P{inHg})		
Exit flowrate corrected: (dscfm)[4]	3,313	4,422
Exit flowrate corrected to 3% O_2	3,868	5,163
Calculated Grain Loading (gr/dscf @ 3% O_2) [4]	0.001	0.001
PM Loading Standard (IDAPA 58.01.01.677)[5] (gr/dscf @ 3% 02) - Diesel Fuel	0.050	0.050
Compliance w/ PM Loading Standard	**Yes**	**Yes**

[1] PM emission rate based on diesel emission factor using 1% diesel (Enviro Design engine uses 99% Natural Gas and 1% Distillate Fuel)

[2] Appendix A-7 to 40 CFR part 60, Method 19—Determination of sulfur dioxide removal efficiency and particulate, sulfur dioxide and nitrogen oxides emission rates, Table 19-2 (F Factors for Various Fuels)

[3] Fd, Volumes of combustion components per unit of heat content (scf/million Btu). Fd for diesel fuel is 9,190 dscf/106 Btu.

[4] (Flow $_{3\%}$) = (Flow $_{0\%}$)x (20.9/(20.9 - 3)), where 20.9 = Oxygen concentration in ambient air

[5] (Flow (dscfm) x (7,000 gr/lb) x (PM lb/hr) x (60 min/ hr) = gr/dscf

Appendix F

Air Dispersion Modeling Protocol with Approval Letter and Model Results

Air Dispersion Modeling Report for EnvroDyne, Wendell Facility

EnvironDyne Corporation (EnviroDyne) of Wendell, a unit of Environ FOC is in the process of preparing a 15 Day Permit to Construct (PTC) application for a new power generation facility near Wendell, in Gooding County, Idaho. A modeling protocol was submitted to Idaho Department of Environmental Quality (IDEQ) and the approval letter was received from IDEQ on February 9, 2007 (Appendix F). The following paragraphs describe the modeling methodology, inputs and results. Any deviations from the modeling protocol are also discussed.

The modeling considered the emissions of the 5 internal combustion electrical energy generating engines proposed for this site. Modeling did not include estimated emissions from a proposed 12,000 gallon diesel fuel storage tank. Breathing loss (0.0004 1lb/hr) emissions from this tank are considered insignificant for modeling purposes. Emissions from this tank were accounted for and included in the permit application.

Modeling Methodology

The EPA-approved AERMOD (Version 07026) model was used. AERMOD is a steady-state plume model that simulates air dispersion based on planetary boundary layer turbulence structure and scaling concepts. The model incorporates the ISC Prime algorithm for modeling building downwash, which was developed to address deficiencies in the downwash algorithm previously used in the ISC model. IDEQ adopted the federal mandate requiring the use of the AERMOD dispersion model for permit applications on November 9, 2006. AERMOD was run with the following options.

- Regulatory default options,
- Direction-specific building downwash,
- Actual receptor elevations and hill height scales,
- Complex/intermediate terrain algorithms.

The receptor grid described in the protocol was used.

Meteorological Data

Twin Falls meteorological data was used for this modeling analysis. Twin Falls is closer to and more representative of the project site than Boise. The Twin Falls data was provided by IDEQ from another project site and included data for 1999 through 2003. The data includes Boise upper air data and Twin Falls surface data.

When modeling carcinogenic toxic air pollutants, a 5 year meteorological data set was used with a period average concentration.

Modeling Inputs

The stack heights have changed since the protocol and are summarized in Table 1 along with all other stack parameters.

Emission parameters for the engines were provided by the manufacturer. These exhaust parameters are appropriate to use as the engines will be base-loaded and are intended to operate near full load. It is believed that the engine exhaust parameters for 100% load operation are representative.

The total PAH emission rates have changed from the emission rates presented in the approved modeling. Toxic air pollutants are presented in Table 4. The total PAH emission rates were calculated using half of the AP-42 emission factor of <0.000212 lb/MMBtu. The less than symbol means the compound was tested but not found in any measurable amount. Therefore, EPA Region X recommends using ½ of the maximum amount of the pollutant (*E-mail correspondence with EPA Region X, dated 3/21/07 –attached).* PAH emission factors in AP-42 are based on a single test of a diesel fueled engine. The EnviroDyne engines will run on mostly natural gas (at approximately 99% natural gas, 1% diesel pilot fuel).

For modeling purposes, one-half the AP-42 factor was used (see Table 3.4-4 PAH Emission factor for Large Uncontrolled Stationary Diesel Engines. Emission Factor Rating: E). The emission rates for all other pollutants are included in Tables 2, 3 and 4.

Emissions estimates for NOx, CO, and VOC, were provided by the engine manufacturer, Fairbanks Morse. All other emission factors were obtained from AP-42, *Chapter 3.4 – Large Stationary Diesel and All Stationary Dual-Fuel Engines,* current edition.

Table 1. Stack Parameters

Source ID	Source Description	Stack Height	Temperature	Exit Velocity	Stack Diameter
		(m)	(K)	(m/s)	(m)
DGEN1	Enviro Generator (Dual-Fuel) 9 cylinder	9.75	661	20.94	0.91
DGEN2	Enviro Generator (Dual-Fuel) 9 cylinder	9.75	661	20.94	0.91
DGEN3	Enviro Generator (Dual-Fuel) 12 cylinder	9.75	661	27.92	0.91
DGEN4	Enviro Generator (Dual-Fuel) 12 cylinder	9.75	661	27.92	0.91
DGEN5	Enviro Generator (Dual-Fuel) 12 cylinder	9.75	661	27.92	0.91

Table 2. Annual Emission Rates in tons/year					
Criteria Pollutants					
Source ID	PM_{10}	NO_x	SO_2	CO	VOC
DGEN1	9.9	31.0	2.8	36.9	24.8
DGEN2	9.9	31.0	2.8	36.9	24.8
DGEN3	13.2	41.4	3.8	49.3	33.2
DGEN4	13.2	41.4	3.8	49.3	33.2
DGEN5	13.2	41.4	3.8	49.3	33.2
Total	59.2	186.4	16.9	221.9	149.1
NOTES: THE EMISSIONS FOR ENVIRON GENERATORS INCLUDE A CO CATALYST AND ARE OPTIMIZED FOR LOWER NOX EMISSIONS.					

Table 3. Maximum Hourly Emission Rates in pounds/hour					
Criteria Pollutants					
Source ID	PM_{10}	NO_x	SO_2	CO	VOC
DGEN1	2.3	7.1	0.6	8.4	5.7
DGEN2	2.3	7.1	0.6	8.4	5.7
DGEN3	3.0	9.5	0.9	11.3	7.6
DGEN4	3.0	9.5	0.9	11.3	7.6
DGEN5	3.0	9.5	0.9	11.3	7.6
NOTES: THE EMISSIONS FOR ENVIRON GENERATORS INCLUDE A CO CATALYST AND ARE OPTIMIZED FOR LOWER NOX EMISSIONS.					

Table 4. Maximum Hourly Emissions for Toxic Air Pollutants in pounds/hour					
Source ID	Benzene	Formaldehyde	Benzo(a)pyrene	Total PAH	Acetaldehyde
DGEN1	1.56E-02	1.59E-03	5.17E-06	2.13E-03	5.07E-04
DGEN2	1.56E-02	1.59E-03	5.17E-06	2.13E-03	5.07E-04
DGEN3	2.08E-02	2.12E-03	6.90E-06	2.85E-03	6.77E-04
DGEN4	2.08E-02	2.12E-03	6.90E-06	2.85E-03	6.77E-04
DGEN5	2.08E-02	2.12E-03	6.90E-06	2.85E-03	6.77E-04

Ambient Conditions

The background concentrations were provided by IDEQ in the Approval Letter dated February 9, 2007. IDEQ determined that default background concentrations for rural/agricultural areas are most appropriate for Wendell except for 24 Hour PM_{10}. For 24 Hour PM_{10}, the 95th percentile of all data collected near Rupert, Idaho was considered representative of background conditions. This data is part of a study performed by Geomatrix that was submitted to IDEQ in January, 2007. This Geomatrix study is included in Appendix F of this report. The ambient concentrations used are summarized in Table 5.

Table 5. Background Criteria Pollutant Concentrations (µg/m3)					
Pollutant	**1-hr**	**3-hr**	**8-hr**	**24-hr**	**Annual**
NO_x	-	-	-	-	17
SO_2	-	34	-	26	8
PM_{10}	-	-	-	46.6*	26
CO	3600	-	2300	-	-
* THIS CONCENTRATION IS BASED ON DATA COLLECT BY GEOMATRIX NEAR RUPERT, ID.					

Results

All criteria pollutants except CO were above the Significant Contribution Levels (SCL), however, IDEQ has determined that there are no co-contributing sources within 1kilometer of the source, therefore no additional sources needed to be modeled.

The overall modeled impacts are below the Ambient Air Quality Standards. The overall impacts include background concentrations and the maximum modeled concentration by pollutant and averaging period. The toxic pollutants modeled were compared to the acceptable ambient concentrations and all pollutants were below these concentrations. The modeling results are summarized in Table 6. All modeled impacts occur at the fenceline where the spacing was 25 meters, therefore no additional refined analysis was needed.

The modeling files are attached on CD.

Table 6. Modeling Results for Environ (units ug/m3)							
Pollutant	**Averaging Period**	**Criteria**	**Background**	**Modeled Conc.**	**Overall Modeled Conc.**	**Below Criteria**	**Year**
Criteria Pollutants							
CO	1-HR	40,000	3,600	936.6	4,537	Yes	2001
CO	8-HR	10,000	2,300	644.4	2,944	Yes	2001
NO_2	ANNUAL	100	17	39.7	57	Yes	2003
PM_{10}	24-HR*	150	46.6	61.8	108	Yes	Combined
	ANNUAL	50	26	11.8	38	Yes	Combined
SO_2	ANNUAL	150	8	3.6	12	Yes	2003
	24-HR	365	26	19.7	46	Yes	2003
	3-HR	1300	34	65.0	99	Yes	2001
Toxics**							
Acetaldehyde	Annual	4.50E-01	0	2.65E-03	2.65E-03	Yes	Combined
Benzene	Annual	1.20E-01	0	8.13E-02	7.98E-02	Yes	Combined
Formaldehyde	Annual	7.70E-02	0	8.29E-03	8.11E-03	Yes	Combined
Benzo(a)pyrene	Annual	3.00E-04	0	3.00E-05	3.00E-05	Yes	Combined
Total PAHs	Annual	1.40E-02	0	1.11E-02	1.09E-02	Yes	Combined

Notes

*The 24-Hour PM10 concentration is for the 6th High

** The toxics and Annual PM10 concentration used a combined 5 year meteorological data file.

EPA Region X, E-mail Correspondence

McCormick, Rick/BOI

From: Huntley.Roy@epamail.epa.gov
Sent: Wednesday, March 21, 2007 6:13 AM
To: Brown, Louise/PDX
Cc: Ingram.Ann@epamail.epa.gov
Subject: Re: question

pic03276.jpg (53 KB)

Louise, your question was forwarded to me. Here are my thoughts.

That less than symbol means that the compound was tested for but not found in any measurable amount. The number there represents the detection limit of the test.

So whether to use it or not depends on your purpose. Say you wanted to be conservative and you wanted to figure the maximum amount of a particular compound that COULD be coming from this process. In that case I would recommend that you use 1/2 of the number. On the other hand, if you were doing an emission inventory for this process, I would use zero unless you had other information that makes you suspect that that particular compound should be emitted, then you would use 1/2. I personally would never use the number as is.

Roy Huntley
Environmental Engineer
Emission Inventory and Analysis Group
Mail Drop (C339-02)
Environmental Protection Agency
RTP, NC 27711
Voice - 919 541-1060
Fax - 919 541-0684
Office 341H

Ann Ingram/RTP/USEPA/US — 03/21/2007 08:19 AM

To: Roy Huntley/RTP/USEPA/US@EPA
cc:
Subject: question

Can you help me with this question?

"When using AP-42 emission factors that are marked as "<" a value, is it best to use the value given, half of the value or 0? For example, in table 3.4-4, the emission factor given for benzo(h,h,l)perylene is <5.56E-07. Is it best to use 5.56E-07, 2.78E-07 or 0?"

(Embedded image moved to file: pic03276.jpg)
Ann
Info CHIEF Help Desk
Supporting EPA's Emission Inventory & Analysis Group
and the Measurement Policy Group

(919) 541-1000
info.chief@epa.gov
----- Forwarded by Ann Ingram/RTP/USEPA/US on 03/21/2007 08:15 AM -----

Louise.Brown@CH2M.com

To

03/20/2007 06:10 PM

Chief Info@EPA

cc

Subject

AP-42 emission factors

Hello,

When using AP-42 emission factors that are marked as "<" a value, is it best to use the value given, half of the value or 0?

For example, in table 3.4-4, the emission factor given for benzo(h,h,l)perylene is <5.56E-07. Is it best to use 5.56E-07, 2.78E-07 or 0?

Thank you,

Louise Brown
CH2M HILL
2020 SW Fourth Ave., 3rd Floor
Portland, OR 97201
louise.brown@ch2m.com
office: 503-872-4779
cell: 503-799-0876
fax: 503-736-2000
#643

Modeling Protocol

Air Dispersion Modeling Protocol for Environ, FOC Wendell Facility

(15-dayPermit Construction Approval)

Wendell, Idaho

Environ

Submitted to:

Idaho Department of Environmental Quality

February 2007

Prepared By:

CH2MHILL

Brief Project Background

EnvironDyne is in the process of preparing a 15-day Permit to Construct (PTC) application for a new power generation facility near Wendell, in Gooding County, Idaho. The new power facility, owned and operated by Environ, FOC will combust duel fuel which contains both natural gas and biodiesel and which will produce approximately 12 megawatts of electrical energy. Maximum emissions are based on the facility operating for 24 hours a day, 7 days a week. The facility intends to use approximately 2 megawatts of energy and sell approximately 10 megawatts of energy to Idaho Power.

An air quality impact analysis will be performed in support of the pre-permit construction approval per IDAPA 58.01.01.213. Idaho regulation requires the facility applying for a PTC to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) and with Toxic Air Pollutant (TAP) standards (IDAPA 58.01.01.210).

This air dispersion modeling protocol is being submitted to the Idaho Department of Environmental Quality (IDEQ) for approval prior to the initiation of the air quality modeling for the Environ facility. This document summarizes the modeling methodology that will be used to evaluate the facility's impacts to air quality with respect to criteria and toxic air pollutants. It has been prepared based on the U.S. Environmental Protection Agency (EPA) *Guidelines on Air Quality Models* (GAQM), and the *State of Idaho Air Quality Modeling Guideline* (ID AQ-01, December 31, 2002).

Sources

Process Description

The facility will use a dual fuel containing a constant ratio of both natural gas and biodiesel to produce approximately 12 megawatts of electrical energy. The facility will use 2 megawatts of energy and sell approximately 10 megawatts of energy to Idaho Power. There will be 4 Enviro dual fuel generators and one non–Enviro dual fuel generator. The facility will have one 12,000 gallon bio-diesel above ground storage tank with a fixed roof. The emissions from this storage tank are considered insignificant and will not be included in the modeling analysis. The facility will operate 8760 hours a year for potential emissions purposes.

Emission Control Description

The CO emissions from the Enviro generators will be controlled by a CO catalyst. NO_x controls may need to be revised during the modeling and final report stages. The engines will be set and operated to minimize NOx emissions.

Source Parameters

The modeling analysis will include five stacks that will be modeled as point sources, one for each of the dual fuel generators. There will be four Enviro generators and one non-

Enviro generator. The source parameters are summarized in Table 1 and are based on the use of duel fuel. A facility layout showing the location of buildings and emissions sources will be included in the final report. These parameters are based on preliminary design information, and may be updated in the permit application.

Table 1. Stack Parameters					
Source ID	Source Description	Stack Height	Temperature	Exit Velocity	Stack Diameter
		(m)	(K)	(m/s)	(m)
DGEN1	Enviro Generator 1(Dual-Fuel)	3.96	660.93	17.14	0.91
DGEN2	Enviro Generator 2(Dual-Fuel)	3.96	660.93	17.14	0.91
DGEN3	Enviro Generator 3(Dual-Fuel)	3.96	660.93	17.14	0.91
DGEN4	Enviro Generator 4(Dual-Fuel)	3.96	660.93	17.14	0.91
DGEN5	Non-Enviro Generator 5 (Straight Dual Fuel)	3.96	660.93	17.14	0.91

Emissions

The estimated criteria emissions by source and pollutant are shown in Tables 2 and 3. The emission rates are based on burning a constant ratio of natural gas and biodiesel. VOC emissions will not be modeled because VOC is regulated as a precursor to ozone and there is no ambient standard for VOC. The emission rates included in this analysis are subject to change.

TAP emissions will be estimated and compared to the screening emission limits (EL) specified in the regulation (IDAPA 58.01.01 585 and 586). Modeling will be performed for those TAPs whose emission estimate is greater than the EL. Table 4 show those TAPs with emissions above the EL, for which modeling will be required. The TAPs emission rates are based on burning a constant ratio of natural gas and biodiesel.

Table 2. Annual Emission Rates in tons/year					
Criteria Pollutants					
Source ID	PM_{10}	NO_x	SO_2	CO	VOC
DGEN1	14.6	29.2	2.7	49.7	23.4
DGEN2	14.6	29.2	2.7	49.7	23.4
DGEN3	14.6	29.2	2.7	49.7	23.4
DGEN4	14.6	29.2	2.7	49.7	23.4
DGEN5	0.0	87.7	2.7	19.9	17.5
Total	58.5	204.6	13.3	218.6	111.0
Notes: The emissions for Environ generators include a CO Catalyst and are optimized for lower NOx emissions.					

Table 3. Maximum Hourly Emission Rates in pounds/hour					
Criteria Pollutants					
Source ID	PM_{10}	NO_x	SO_2	CO	VOC
DGEN1	3.34	21.92	0.66	4.97	4.38
DGEN2	3.34	21.92	0.66	4.97	4.38
DGEN3	3.34	21.92	0.66	4.97	4.38
DGEN4	3.34	21.92	0.66	4.97	4.38
DGEN5	0.005	20.02	0.61	4.54	4.00
Notes: The emissions for Environ generators include a CO Catalyst and are optimized for lower NOx emissions.					

Table 4. Maximum Hourly Emissions for Toxic Air Pollutants in pounds/hour				
Source ID	Benzene	Formaldehyde	Benzo(a)pyrene	Total PAH
DGEN1	1.47E-02	1.49E-03	4.87E-06	4.01E-03
DGEN2	1.47E-02	1.49E-03	4.87E-06	4.01E-03
DGEN3	1.47E-02	1.49E-03	4.87E-06	4.01E-03
DGEN4	1.47E-02	1.49E-03	4.87E-06	4.01E-03
DGEN5	1.47E-02	1.49E-03	4.87E-06	4.01E-03

Regulatory Review

Standards and Criteria Levels

Table 5 summarizes applicable criteria including:

- Significant contribution levels (SCL),
- National Ambient Air Quality Standards (NAAQS).

Table 5. Regulatory Standards and Significance Levels				
Pollutant	Averaging	NAAQS		SCL
	Period	µg/m³	ppm	(µg/m³)
CO	8-Hour	10,000	9	500
	1-Hour	40,000	35	2,000
NO_2	Annual	100	0.053	1
PM_{10}	Annual	50	--	1
	24-Hour	150	--	5
$PM_{2.5}$	Annual	15	--	--
	24-Hour	35	--	--
SO_2	Annual	80	0.03	1
	24-Hour	365	0.14	5
	3-Hour	1300	0.5	25

Modeled concentrations will be compared to the applicable Idaho significant contribution levels (SCL) shown in Table 5. If the predicted impacts are not significant (that is, less than the SCL), the modeling is complete for that pollutant under that averaging time. If impacts are significant, a more refined analysis will be conducted for demonstration of compliance with the NAAQS. A description of the modeling methodology is presented below.

Dispersion Model

The EPA-approved AERMOD (Version 07026) model will be used. AERMOD is a steady-state plume model that simulates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. This model is recommended for short range (< 50 km) dispersion from the source. The model incorporates the ISC Prime algorithm for modeling building downwash, which was developed to address deficiencies in the downwash algorithm previously used in the ISC model. AERMOD is designed to accept input data prepared by two specific pre-processor programs, AERMET and AERMAP. IDEQ adopted the federal mandate requiring the use of the AERMOD dispersion model for permit applications on November 9, 2006. AERMOD will be run with the following options.

- Regulatory default options,
- Direction-specific building downwash,
- Actual receptor elevations and hill height scales,
- Complex/intermediate terrain algorithms.

Building Downwash

Building influences on stacks are considered by incorporating the updated EPA Building Profile Input Program [BPIP-Prime]. The stack heights used in the dispersion modeling will be the actual stack height or Good Engineering Practice (GEP) stack height, whichever is less.

Meteorological Data

AERMET modeling files were developed by IDEQ for Boise, Idaho for 1989 to1991. These Boise AERMET files will be used since AERMET files are not available for a site closer to the facility. The site characteristics used when processing AERMET will be provided by IDEQ. These characteristics include albedo, surface roughness, and Bowen ratio for each season and each 30-degree wind direction sector.

AERMET accepts National Weather Service (NWS) 1-hour surface observations, NWS twice-daily upper air soundings, and data from an on-site meteorological measurement system. These data are processed in three steps. The first step extracts data from the archive data files and performs various quality assessment checks. The second step merges all available data (both NWS and on-site). These merged data are stored together in a single file. The third step reads the merged meteorological data and estimates the boundary layer parameters needed by AERMOD. AERMET writes two files for input to AERMOD: a file of hourly boundary layer parameter estimates and a file of multiple-level (when the data are available) observations of wind speed and direction,

temperature, and standard deviation of the fluctuating components of the wind direction.

For PM_{10} modeling a combined data file for all three years will be used according to IDEQ request. For all other pollutants a data file for each year will be used.

Ambient Conditions

Background concentrations for this facility will be provided by IDEQ. The completed Table 6 will be included with the final report.

Table 6. Background Criteria Pollutant Concentrations ($\mu g/m^3$)					
Pollutant	**1-hr**	**3-hr**	**8-hr**	**24-hr**	**Annual**
NO_x					
SO_2					
PM_{10}					
CO					

Receptors

The ambient air boundary will be the fenceline. The selection of receptors in AERMOD will be as follows:

- The first run will be a 500-meter coarse grid with a nested Cartesian grid of 100 meter-spaced receptors as follows:
  - The 100-meter grid will extend approximately 1 km around the facility.
  - The 500-meter grid will extend approximately 5 km,
  - Receptors will be placed at 25-meter intervals around the fenceline.
- A second run using a fine receptor grid will be centered on the point of maximum impact and re run using a 50 meter grid spacing.
- Receptor elevations will be calculated by AERMAP as described below.

AERMAP will be run to process terrain elevation data for all sources and receptors using 7.5 minute Digital Elevation Model (DEM) files prepared by the USGS. AERMAP first determines the base elevation at each source and receptor. For complex terrain situations, AERMOD captures the physics of dispersion and creates elevation data for the surrounding terrain identified by a parameter called hill height scale. AERMAP creates hill height scale by searching for the terrain height and location that has the greatest influence on dispersion for each individual source and receptor. Both the base elevation and hill height scale data are produced for each receptor by AERMAP as a file or files which can be directly accessed by AERMOD.

Preliminary Analysis

The preliminary analysis for each pollutant will be conducted as follows:

- If the predicted impacts are not significant (that is, less than the SCL) for each criteria pollutant, the modeling is complete for that pollutant under that averaging time.

- If impacts are significant, a more refined analysis, as described below, will be conducted.
- For NO_x, it will be initially assumed that all NO_x is converted to NO_2. If the resulting concentration exceeds the SCL, then the concentration will be multiplied by the default annual NO_2/NO_x ratio of 0.75 as suggested by EPA and compared to the SCL again. If the resulting concentrations still exceed the SCL, then a refined analysis will be conducted.
- Toxic pollutant impacts will be compared to the acceptable ambient concentrations for non-carcinogens or carcinogens, as applicable.

Refined Analyses – Criteria Pollutants

- Comparison to the Ambient Air Quality Standards
  - For pollutants with concentrations greater than the SCLs, the maximum concentration will be determined and compared to the NAAQS. This maximum concentration will include contributions from the facility, nearby sources, and ambient background concentrations. Background concentrations to be provided by IDEQ will be used to determine concentrations.
  - IDEQ will be contacted to identify nearby sources, if any, that need to be included in the analysis.

Output - Presentation of Results

The results of the air dispersion modeling analyses will be presented as follows:

- A description of modeling methodologies and input data,
- A summary of the results in tabular and, where appropriate, graphical form,
- Modeling files used by AERMOD will be provided with the application on compact disk,
- Any deviations from the methodology proposed in this protocol will be presented.

DEQ Modeling Protocol Approval Letter

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON, BOISE, ID 83706 · (208) 373-0502

C. L. "BUTCH" OTTER, GOVERNOR
TONI HARDESTY, DIRECTOR

February 9, 2007

Natalie Liljenwall
CH2MHill
Portland Office

RE: Modeling Protocol for the Environ Wendell Facility Located near Wendell, Idaho

Natalie:

DEQ received your dispersion modeling protocol on February 7, 2007. The modeling protocol was submitted on behalf of Environ. The modeling protocol proposes methods and data for use in the ambient impact analyses of a Permit to Construct application for a new power facility near Wendell, Idaho.

The modeling protocol has been reviewed and DEQ has the following comments:

- Comment 1: The protocol states that emissions from the 12,000 gallon diesel storage tank will be considered insignificant. You should provide more details within the application to justify exclusion of this source. If inclusion of TAP emissions from this source could result in total facility-wide emissions of a TAP in excess of an emissions screening level (EL), then this source must be included in the inventory and the modeling assessment.

- Comment 2: The application should provide documentation and justification for stack parameters used in the modeling analyses, clearly showing how stack gas temperatures and flow rates were estimated. In most instances, applicants should use typical parameters, not maximum temperatures and flow rates.

- Comment 3: Boise meteorological data is of questionable representativeness for conditions in Wendell, Idaho. To account for this greater uncertainty, modeled impacts (before inclusion of a background concentration) should be increased by 20 percent. If compliance cannot be demonstrated with this increase, DEQ dispersion modeling staff should be consulted to evaluate potential alternative methods.

- Comment 4: The proposed receptor grid appears reasonable. However, it is the applicant's responsibility to use a sufficiently tight receptor network such that the maximum modeled concentration is reasonably resolved. If DEQ conducts

verification modeling analyses with a tighter receptor grid and compliance with standards is no longer demonstrated, the permit will be denied.

- Comment 5: When modeling carcinogenic TAPs, the applicant may use a 5-year meteorological data set, using the period average concentration, rather than five separate 1-year data sets.

- Comment 6: DEQ determined default background concentrations for rural/agricultural areas are most appropriate for the area near Wendell: PM_{10} 24-hr = 73 $\mu g/m^3$; PM_{10} annual = 26 $\mu g/m^3$; CO 1-hr = 3,600 $\mu g/m^3$; CO 8-hr = 2,300 $\mu g/m^3$; NO_2 annual = 17 $\mu g/m^3$; SO_2 3-hr = 34 $\mu g/m^3$; SO_2 24-hr = 26 $\mu g/m^3$; SO_2 annual = 8 $\mu g/m^3$; Pb quarterly = 0.03 $\mu g/m^3$.

- Comment 7: To evaluate whether there are any co-contributing sources in the area, DEQ needs the UTM coordinates of the proposed site. Generally, DEQ considers co-contributing sources to be those within one kilometer of the minor source facility.

- Comment 8: Attached are Boise meteorological files as processed through AERMET. Also attached is a spreadsheet that provides calculations for sector-specific surface characteristics.

- Comment 9: Please include all modeling files, including modeling runs for the coarse grid. Also, please submit the BPIP input file.

DEQ's modeling staff considers the submitted dispersion modeling protocol, with resolution of the additional items noted above, to be approved. It should be noted, however, that the approval of this modeling protocol is not meant to imply approval of a completed dispersion modeling analysis. Please refer to the *State of Idaho Air Quality Modeling Guideline*, which is available on the Internet at http://www.deq.state.id.us/air/permits_forms/permitting/modeling_guideline.pdf, for further guidance.

To ensure a complete and timely review of the final analysis, our modeling staff requests that electronic copies of all modeling input and output files (including BPIP, raw meteorological data files, AERMET input and output files, and AERMAP input and output files) are submitted with an analysis report. If you have any further questions or comments, please contact me at (208) 373-0112.

Sincerely,

Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112

Geomatrix Report

THE AMALGAMATED SUGAR COMPANY LLC

3184 ELDER STREET • BOISE, ID 83705
PHONE: (208) 383-6500 • FAX: (208) 383-6688

January 17, 2007

Kevin Schilling, Air Quality Modeling Coordinator
Idaho Department of Environmental Quality
1410 North Hilton
Boise, ID 83706-1255

Re: Proposed Alternative Background Concentrations - Mini-Cassia Facility.

Dear Kevin:

The Amalgamated Sugar Company LLC (TASCO) hired an outside consultant (Geomatrix, Lynnwood, Washington) to evaluate the Mini-Cassia facility's site-specific background 24-hour PM_{10} concentrations. The Geomatrix evaluation and conclusions are attached for the Departments review. TASCO proposes to use these refined background concentrations for the NAAQS evaluations at the Mini-Cassia facility.

Currently, the ambient background concentration for the Paul area recommended by IDEQ is 73 micrograms / cubic meter ($\mu g/m^3$). This background concentration for rural Idaho is very high and rarely occurs. The IDEQ 2006 Draft Modeling Guidelines state that facilities may propose alternate/refined background concentrations with appropriate justification.

To address the need for more representative site-specific background concentrations, TASCO asked Geomatrix to review the available data and offer a more representative background concentration. Geomatrix developed two approaches. The first scenario is based on seasonal background concentrations, while the second scenario is a more traditional single year-round concentration. These PM_{10} concentrations are based on the 95th percentile observations at Rupert after excluding "rare natural events". These site-specific background concentrations are more reflective of actual background concentrations at the site.

Based on an analysis of observations at a nearby Rupert PM_{10} monitoring site, TASCO proposes the following 24-hour background PM_{10} concentrations:

Seasonal Background
- Winter – 32 $\mu g/m^3$
- Spring – 45 $\mu g/m^3$
- Summer – 56 $\mu g/m^3$
- Fall – 45 $\mu g/m^3$

Year-Round Background
- 46.6 $\mu g/m^3$

If you have any questions about our proposal, please contact either Dean C. DeLorey, Manager of Environmental Compliance, or me at 383-6500.

Sincerely,

Michael S. Dalton, P.E.

Attachment
cc: Dean DeLorey, John McCreedy, Boise CO
Alan Hieb, Karen Cummings, Mini-Cassia
Almer Casile, IDEQ

1410 N Hilton
Boise, ID 83706
Phone: 1(208) 373-0502
Fax: 1(208) 373-0340

Department of Environmental Quality- AIR QUALITY

Fax

To: Rick McCormick	From: Kevin Schilling
Company: CH2M Hill	DEQ, Air Quality-
Fax: 208 395 5315	Date: 2/27/07
Phone: 383 6457	Pages: 12
Re: Background Conc.	C:

☐ Urgent For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

•Comments:

Rick. This approch has not received final DEQ approval. I would suggest you review it for applicability to your site, then submit an argument with the application. Include the geomatrix report as an appendix to the application so we have a complete package

Geomatrix

January 4, 2007

Michael S. Dalton
The Amalgamated Sugar Company LLC
3184 Elder Street
Boise, ID 83705

Subject: PM10 Background Concentration Analysis
Mini-Cassia Plant

Dear Michael:

At The Amalgamated Sugar Company's (TASCO) request, Geomatrix conducted an analysis of ambient PM10 concentrations near the Mini-Cassia Plant. The analysis was performed to establish a site-specific 24-hour background PM10 concentration to be used in National Ambient Air Quality Standard (NAAQS) assessments for the Mini-Cassia Plant. Based on an analysis of observations at the nearby Rupert monitoring site, we believe the following conservative seasonal 24-hour background PM10 concentrations could be used in ambient air quality modeling assessments:

- Winter – 32 $\mu g/m^3$
- Spring – 45 $\mu g/m^3$
- Summer – 56 $\mu g/m^3$
- Fall – 45 $\mu g/m^3$

These PM10 concentrations are based on the 95th percentile observations at Rupert after excluding "rare natural events". The remainder of this letter describes the basis of our recommendation.

Background

In order to assess the NAAQS, air quality model predictions are usually added to a background concentration to account for sources not included explicitly in the simulations. Following EPA Guidance (40 CFR Part 51 Appendix W) short-term ambient impacts should be based on a predicted design concentration plus a background concentration that can "reasonably" be assumed to occur with the design concentration. The design concentration for the 24-hour PM10

19203 36th Avenue West, Suite 101
Lynnwood, Washington 98036-5772
Tel 425.921.4000
Fax 425.921.4040
www.geomatrix.com

NAAQS is the highest 6th high prediction with a five year meteorological data set, a fairly rare event. The probability of such an event is 6 in about 1,825.

Geomatrix used a background PM10 concentration of 73 $\mu g/m^3$ in previous simulations for the Mini-Cassia Plant. This background concentration was provided by Idaho Department of Environmental Quality (DEQ) and is their generic recommended background concentration for rural agricultural areas. In other guidance,[1] DEQ lists a background concentration of 76 $\mu g/m^3$ for Rupert, close to their generic concentration assigned to rural areas. The conservative DEQ procedures are based on the 99th percentile 24-hour observation, excluding periods influenced by fires, regional dust storms, or other "rare natural events."

Geomatrix is not aware of any EPA guidance for developing a "reasonable" background concentration from local ambient monitoring data when such data are not collected concurrently with the period of the model simulations. However, we interpret reasonable to mean that physically unrealistic combinations of background and model predicted concentrations should not be added together to assess the NAAQS. For example when predicted and observed concentrations occur under different meteorological conditions or when seasonal sources cause background PM10 concentrations to be high during the summer while the hypothetical source in question only operates during the winter. Further since the 24-hour PM10 NAAQS is a statistically based criterion, it is not necessary and extremely conservative to add the 6th highest observed background concentration in 5 years to the predicted design concentrations unless the sources and causes are perfectly correlated. If the causes are completely unrelated, the joint probability would be about eleven in a million, much less frequent than the basis for the 24-hour PM10 NAAQS.

Methods

Geomatrix surveyed local PM10 monitoring data sets for the background analysis. Possible data sets include the one year of data collected by Simplot in Heyburn and the multiple year data set collected by DEQ in Rupert from 1995 to June 2002. The PM10 monitoring data set collected by Simplot in Heyburn contains several days of elevated PM10 concentrations due to regional dust events and potentially due to impacts from the Simplot facility. This monitor was located specifically to assess NAAQS compliance from PM10 sources at the Simplot facility. While background PM10 concentrations might be derived by excluding exceptional events and/or periods where it can be demonstrated that Simplot sources influenced the monitor, the Heyburn data are less suited for estimates of background at the Mini-Cassia Plant than the data collected at Rupert.

[1] DEQ, 2003. "Background Concentrations for Use in New Source Review Dispersion Modeling." Memorandum from Rick Hardy and Kevin Schilling, DEQ, Technical Services Modeling Group to Mary Anderson, DEQ Air Program Modeling Coordinator. March 14, 2003.

A more suitable candidate for a site-specific PM10 background concentration is the monitoring data set collected by DEQ at Rupert from January 1995 through June 2002. During this period 441 daily samples were collected on an approximate one in six day sampling schedule. The Rupert monitoring site is about 4 miles east of the Mini-Cassia Plant. DEQ used a portion of this data set in their derivation of the recommended PM10 background concentration of 76 $\mu g/m^3$ for Rupert.[1] DEQ notes that this background concentration is conservative because it occurred during a period when the region was influenced by a synoptic scale Asian dust storm. The Rupert data are also somewhat conservative because the monitoring site is downwind in the prevailing wind direction and observations at Rupert all ready include some contribution from the Mini-Cassia Plant.

Figure 1 shows a time series plot of all the 24-hour observations at Rupert compared to the DEQ recommended backgrounds of 73 $\mu g/m^3$ and 76 $\mu g/m^3$, for rural agricultural areas and Rupert, respectively. With the exception of a few events, the DEQ background is much higher than commonly observed near the Mini-Cassia Plant. The more likely median PM10 concentration at Rupert during the data periods is 21 $\mu g/m^3$. The Rupert data also exhibits a seasonal cycle with generally higher PM10 concentrations during the late summer and early fall months than during the winter.

Geomatrix performed a statistical analysis on the Rupert PM10 data following the same general techniques as used by DEQ. However we considered the seasonality of the observations, used a longer period of record, and examined more probable concentrations. The procedures were as follows:

- Exclude exceptional events based on guidance from DEQ and examination of concurrent local weather observations
- Group the Rupert data in seasons. Operations at the Mini-Cassia Plant are seasonal with higher PM10 emissions during the winter Beet Campaign and lower emissions during the summer
- Calculate the probability of PM10 concentrations using a slightly less conservative basis than DEQ. DEQ selected PM10 background concentrations using probabilities close to the basis of the standard, which is the 6th highest observation in 5 years (99.7th percentile). We also derive background concentrations using percentiles ranging from the median (most likely) to the 99th percentile.

Geomatrix examined the local weather records at Burley and Twin Falls Airports for all days with observations above 60 $\mu g/m^3$. We also consulted with Mr. Rick Hardy of DEQ who performed DEQ's background PM10 analysis.[1] Table 1 shows the six events we excluded from

further analysis based on these conversations and examination of the meteorological observations. We excluded several days with high winds and observed blowing dust. In previous simulations of the PM10 sources at the Mini-Cassia Plant, the higher predictions occur during conditions conducive to building downwash effects. Such meteorological conditions are characterized by persistent winds at more moderate wind speeds than observed during the dust events we excluded from the analysis. We also excluded the April 29, 1998 Asian dust event per conversations with DEQ.

Results

Table 2 lists PM10 concentrations at different accumulated probabilities by month and season. Figure 2 displays these same data graphically. The data are lognormally distributed about a seasonal median that is higher in the summer months. With the exception of the maximum observations, the probabilities of the higher events are also seasonal.

Geomatrix recommends that the 95th percentile PM10 concentrations in Table 2 for each season be used as the basis for 24-hour background concentrations at the Mini-Cassia Plant. A seasonal background more reasonably reflects concentrations near the Mini-Cassia and provides some consideration of likely lower background concentrations during the Beet Campaign. We do not recommend that monthly background concentrations be used as the number of samples for each month is low and introduces greater uncertainty in the statistics at the higher end of the frequency distribution.

Figure 3 compares our recommendation with the Rupert data and the DEQ background concentrations. The 95th percentile is still conservative and a more robust measure than the maximum, a background based on the 99th percentile, and/or the design concentration (6 in 1,825). We believe the 95th percentile is good compromise between the need to be conservative for regulatory assessments and recognition that the likelihood of extremely high source impacts on the same day as the highest background concentration is very remote.

Geomatrix would like thank TASCO for considering us for this study. If you should have any questions regarding our analysis of PM10 background concentrations near the Mini-Cassia Plant, please contact us in the near future.

Sincerely yours,
GEOMATRIX CONSULTANTS, INC.

Ken Richmond
Sr. Air Quality Scientist

Enclosures: Tables and Figures

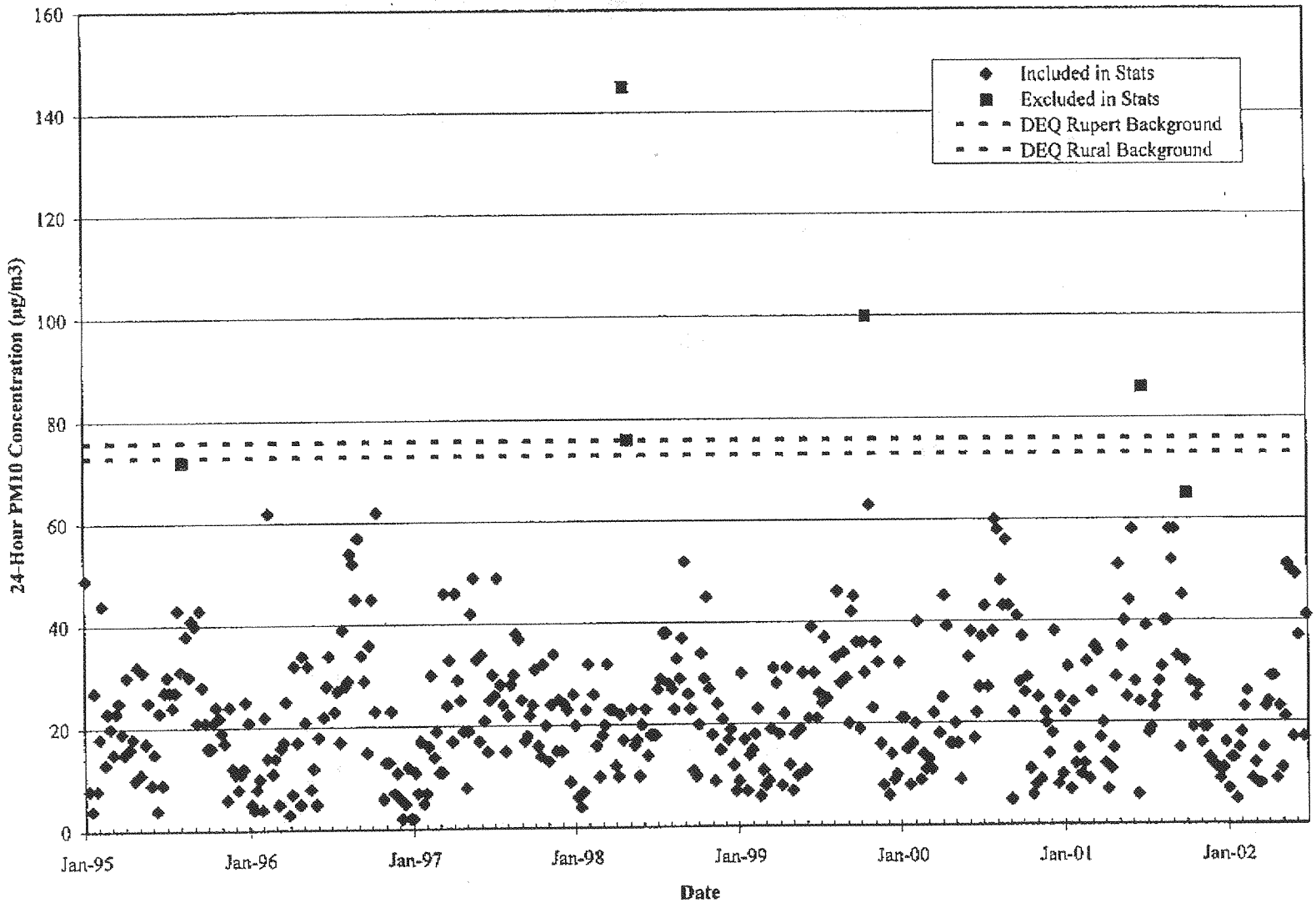
**Table 1. Days Excluded from PM10 Background Analysis
Rupert Observations from January 1995 through June 2002**

Date	PM10 Concentration ($\mu g/m^3$)	Comment
8/7/1995	72	Gusts to 28 mph at Burley and 37 mph at Twin Falls, blowing dust observed at Twin Falls and Burley Airports
4/23/1998	145	Gusts to 46 mph at Burley and 44 mph at Twin Falls, blowing dust observed at Twin Falls and Burley Airports
4/29/1998	76	Elevated PM10 due in part to synoptic scale Asian dust transport
10/15/1999	100	Gusts to 30 mph at Burley and 40 mph at Twin Falls
6/24/2001	86	Gusts to 28 mph at Burley and 48 mph at Twin Falls, haze observed at Twin Falls and Burley Airports with visibilities less than 2.5 km.
10/4/2001	65	Gusts to 28 mph at Burley and 28 mph at Twin Falls

Table 2. Seasonal and Monthly 24-Hour PM10 Frequency Distributions
Rupert Observations from January 1995 through June 2002

Period	Num.	24-hour PM10 ($\mu g/m^3$) for Different Accumulated Probabilities [1]						
		Max.	99%	98%	95%	90%	75%	50%
January	42	49	42.0	35.1	31.0	26.7	19.3	12.5
February	35	62	55.9	49.8	41.2	31.2	23.0	16.0
March	40	46	41.7	37.4	34.1	32.1	24.3	18.5
April	39	46	45.6	45.2	39.6	32.4	29.0	19.0
May	38	51	51.0	51.0	50.2	45.5	32.8	19.5
June	38	58	54.7	51.3	42.2	39.0	33.0	23.5
July	31	60	56.7	53.4	46.0	43.0	37.5	27.0
August	35	58	58.0	58.0	57.3	55.2	45.5	37.0
September	36	58	55.9	53.8	46.8	45.0	37.8	27.0
October	33	63	62.7	62.4	51.8	35.6	29.0	23.0
November	34	36	35.3	34.7	32.7	25.0	22.8	16.0
December	34	38	36.0	34.0	28.1	25.0	19.8	11.5
Winter	111	62	48.5	43.2	32.0	27.0	21.0	14.0
Spring	117	51	50.8	49.7	45.2	35.0	29.0	19.0
Summer	104	60	58.0	58.0	55.7	48.7	38.0	28.5
Fall	103	63	61.9	57.8	45.0	40.8	29.5	22.0
All Data	435	63	58.0	56.3	46.6	40.0	30.0	21.0

1. For example: of the 42 observations in January during 1995 to 2002, 95 percent were less than 31 $\mu g/m^3$. Statistics based on Rupert observations excluding 6 days classified as "rare natural events."

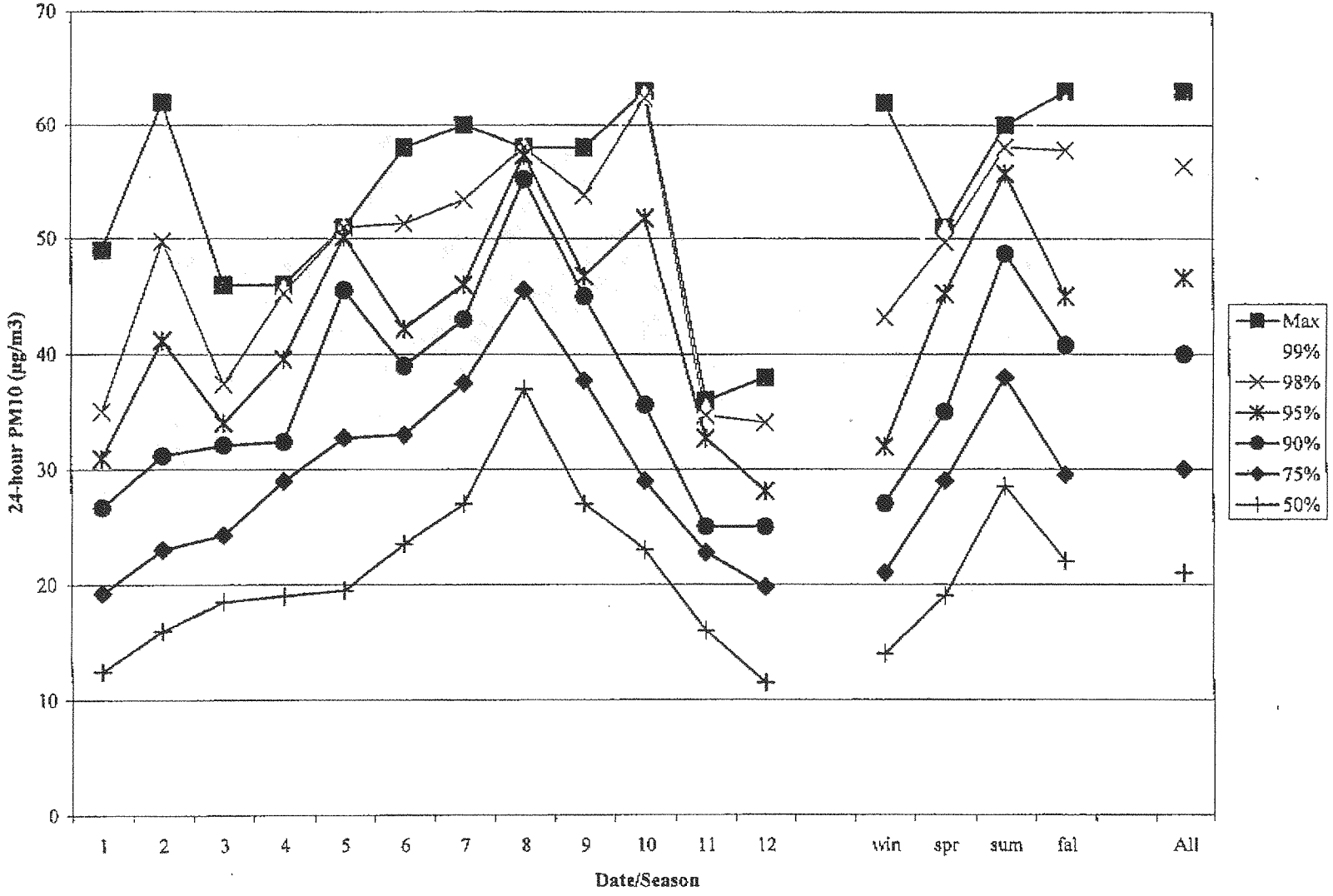


GEOMATRIX

OBSERVED 24-HOUR PM10 CONCENTRATIONS AT RUPERT
Mini-Cassia PM10 Background Analysis
Paul, Idaho

Project No.
13044

Figure
1

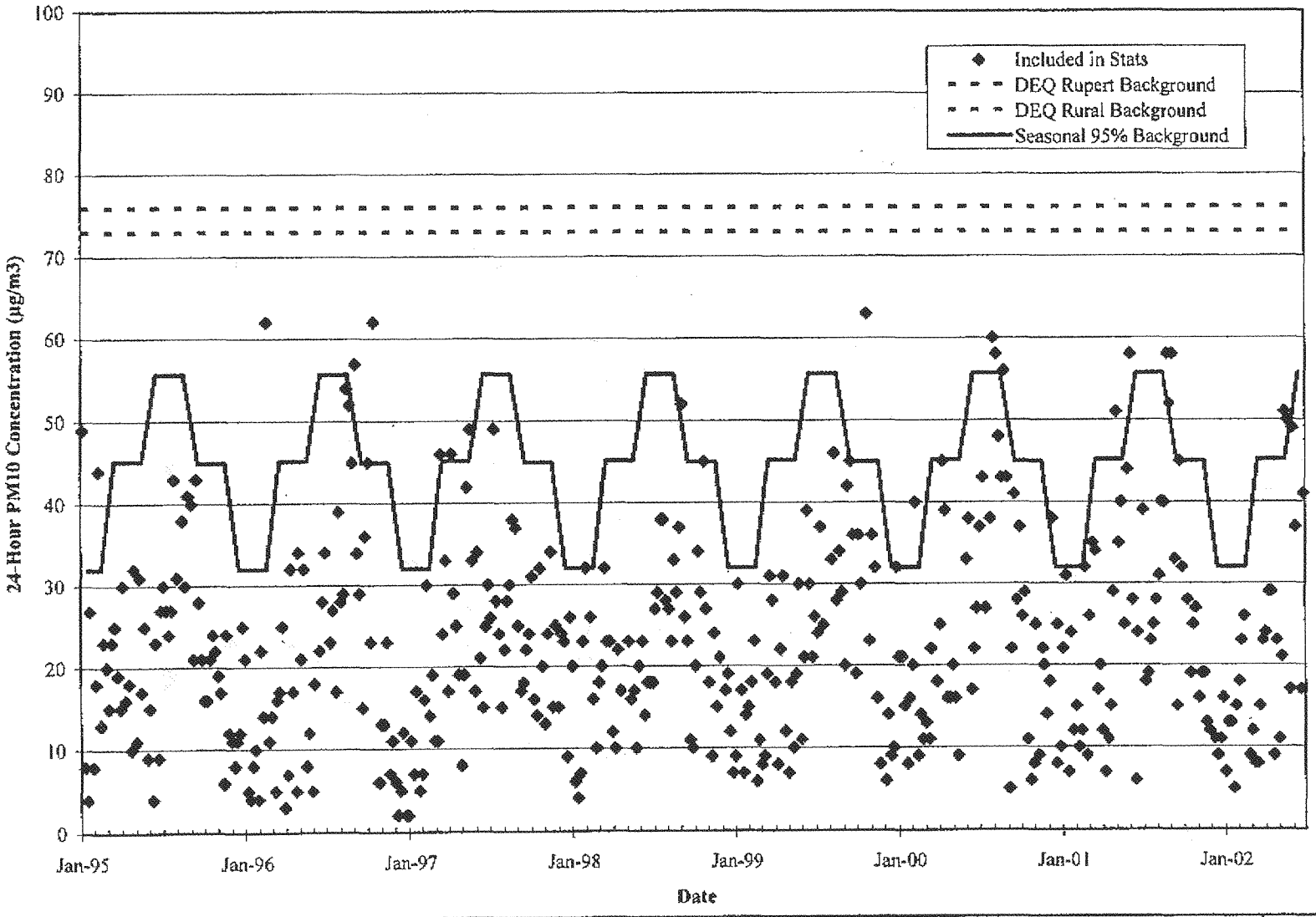


GEOMATRIX

MONTHLY AND SEASONAL 24-HOUR PM10 FREQUENCY DISTRIBUTIONS
Mini-Cassia PM10 Background Analysis
Paul, Idaho

Project No.
13044

Figure
2



GEOMATRIX

95TH PERCENTILE SEASONAL BACKGROUND COMPARED TO RUPERT OBSERVATIONS
Mini-Cassia PM10 Background Analysis
Paul, Idaho

Project No. 13044

Figure 3